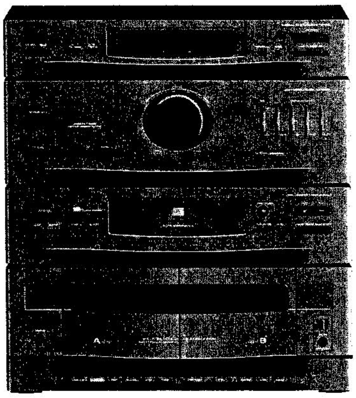
Midi System AS455/22

Service
Service
Service



Service Manual

The set AS455/22 is the same as AS445/20G except Tuner 92 board is used instead of ECO4 Tuner.

Except for the mechanical parts we refer to Service Manual AS445/xxG (4822 725 24929).

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PCS 83 226

PHILIPS

MECHANICAL PARTS

401	4822 426 30153	Side Left
402	4822 443 64289	Cassette Door L
403	4822 450 62087	Window Cassette L
404	4822 450 62088	Window Cassette R
406	4822 443 64291	Cassette Door R
407	4822 492 63927	Leaf Spring
408	4822 443 63037	Tech. Cassette Door
409	4822 413 41881	Knob Volume
411	4822 492 51374	Ring
412	4822 381 11418	Window IR
413	4822 450 62324	Window
414	4822 426 51769	Front Cabinet
415	4822 444 30495	Front CD Tray
417	4822 426 20241	Backplate
418	4822 426 30152	Side Right
419	4822 410 63479	Knob Preset Up/Down
421	4822 410 62624	Knob HSD
422	4822 410 63481	Knob CD Right
423	4822 492 42595	Spring Eject
424	4822 529 10278	Damper Cassette Door
426	4822 410 63478	Button Set Play
427	4822 410 62623	Knob Auto Program
428	4822 410 62617	Knob Selector + Power
429	4822 410 62625	Knob CD Left
431	4822 410 63477	Button Set Rec/Pb
432	4822 411 61929	Knob Equalizer
433	4822 466 93148	Spacer 5mm
434	4822 462 40683	Plate Foot
461	4822 462 71935	Dustcover
462	4822 466 92642	Adaptor
463	4822 444 30496	Front Turntable
464	4822 535 93499	Hinge Pin
466	4822 417 10631	Clamping Block
467	4822 462 41656	Rubber Pad
	4822 218 10513	Remote Control
	4822 445 10359	Loudspeaker Box
	4822 321 10249	Mains Cord IEC

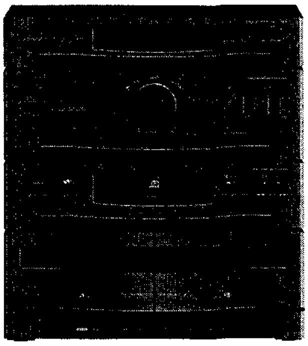
Note: Only the mentioned parts are normal service parts.

4730

Midi System AS440/20, /20P, /22, /22P, /25, /25P, /37

AS445/20, /21, /25, /30

Service
Service
Service



Service Manual

COMPACT
disc
DIGITAL AUDIO

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Service Manual Record Player DL-40
Service Manual Tape Transport RDN-11

**CLASS 1
LASER PRODUCT**

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4730
CS 51 623

Specification

General:

Mains voltage : 220V / 50Hz for /20, /22
: 240V / 50Hz for /25
: 120V or 230V /50Hz via voltage selector for /21, /30
: 120V / 60Hz for /37

Power consumption : ≤ 80 W at maximum output power
: ≤ 10 W in stand by

Amplifier:

Output power : 2 x 10W at 6Ω D=10%
Music power : 2 x 33W at 6Ω
Headphone : 6,3mm stereo jack 25mW at 32Ω (≡0,9V at 32Ω)

Power stage protection : Temperature

Frequency response : 63 Hz - 14 kHz (-3dB) Limit
: 63 Hz - 17 kHz (-3dB) Typical value

Tone control
DBB : ±6dB at 100 Hz
300 Hz : ±6dB at 300 Hz
1 kHz : ±6dB at 1 kHz
4 kHz : ±6dB at 4 kHz
10 kHz : ±6dB at 10kHz

Input sensitivity
PHONO/LINE : 350 mV

Tuner:	FM	MW	LW
Tuning range	87,5 - 108 MHz Grid 50 kHz	522 - 1611 kHz (Grid 9kHz) 530 - 1700 kHz (only for /37) (Grid 10kHz)	148 - 284 kHz (Grid 3kHz)
Aerial input	Coax F-Connector 75 Ω	Ferrite antenna	Ferrite antenna
IF	10,7 MHz ± 25 kHz	450 kHz ± 1 kHz	450 kHz ± 1 kHz
Sensitivity Mono : 26dB S/N	≤ 4 µV (2 µV typ.)	3 mV/m (1,5 mV/m typ.)	≤ 6 mV/m
Stereo : 46dB S/N	≤ 45 µV		
Search tuning	7 µV typ.	≤ 6mV/m	≤ 6mV/m
Distortion	≤3% (2% typ.) RF=1mV Δf=75kHz	≤5% (3% typ) RF=100mV/m m=80%	≤5% (3% typ) RF=100mV/m m=80%
Channel separation	≥26dB (30dB typ)	-	-
Image rejection ratio	30 dB (40 dB typ.)	27 dB (30 dB typ.)	40 dB (43 dB typ.)
-3 dB limiting point	≤ 5 µV (2 µV typ.)		

CD unit:

Have to be measured direct on internal connector 1300

Frequency response : 20 - 20.000 Hz ±2 dB
Output level : 2V ±3 dB
Signal/noise ratio : ≥90 dB
Distortion : ≤1% at 1 kHz
Channel difference : ≤2 dB at 1 kHz
Channel crosstalk : 50 dB max.
De emphasis : 0 or 15/50µs switched automatically by subcode on the disc

Laser
Output power : ≤500µW
Wave length : 780 ± 20 nm

Recorder part:

Tape speed	: 4,76cm/s ±2% in **N**ormal **S**peed
	: 8,5cm/s ±12% in **H**igh **S**peed **D**ubbing
Wow & Flutter	: ≤0,4%
Winding speed	: ≤ 130s for C60 cassette
Erase / Bias system	: AC 60kHz
RIF-shift	: service solution on request
Distortion at 200 nWb/m	: ≤ 5%
Channel difference at PB	: ≤ 3dB
Channel difference overall	: ≤ 3dB
Channel separation	: ≥ 18dB at 1kHz
Track separation	: ≥ 55dB at 1kHz

Phono part:

Power supply	: 12V DC / 80mA
Wow & Flutter	: 0,25% JIS
	: 0,35% DIN
Operating speed	: 33⅓ and 45 rpm
Drive system	: Belt drive with automatic return

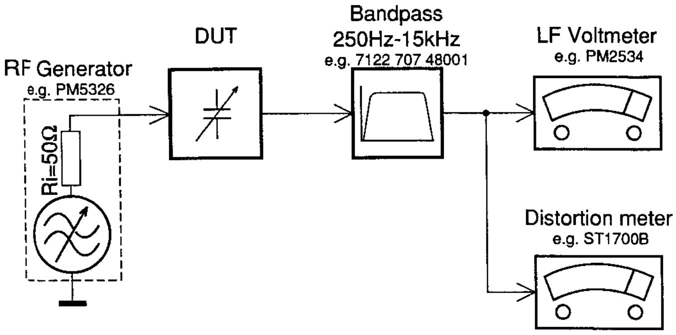
	IEC I	IEC I (dubbing)	IEC II	IEC II (dubbing)	Dubbing HS[3]
Frequency response -8 dB[1]	100Hz - 10kHz	125Hz - 8kHz	100Hz - 10kHz	125Hz - 8kHz	125Hz - 8kHz
Signal to Hiss ratio[2] A-weighted	≥ 45 dB	≥ 45 dB	≥ 45 dB	≥ 45 dB	
Signal to Noise ratio[2] FF-weighted	≥ 40 dB	≥ 40 dB	≥ 40 dB	≥ 40 dB	
Erase attenuation [4]	≥ 55 dB	≥ 55 dB	≥ 55 dB	≥ 55 dB	

[1] typical value [2] at 250 nWb/m [3] at -10dB [4] Use a 1kHz passfilter to minimize the wide band noise component.

The set reacts on following RC5 commands:

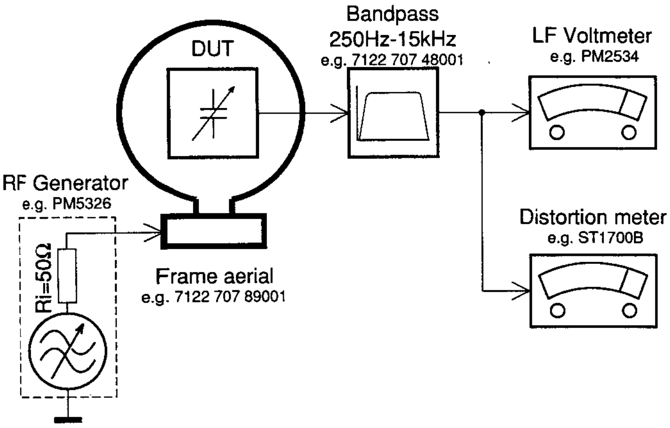
	Systemcode	Commandcode
Stand by	17,20,21	12
Tuner	17	63
Aux/Phono	21	63
CD	20	63
Volume up	16	16
Volume down	16	17
Repeat	20	29
Shuffle	20	28
Scan	20	43
Play (CD)	20	53
Pause (CD)	20	48
Next (CD)	20	32
Previous (CD)	20	33
Search Forward (CD)	20	52
Search Backward (CD)	20	50
Stop (CD)	20	54
Tuning up	17	30
Tuning down	17	31
Preset up	17	32
Preset down	17	33

Tuner FM


RF Generator
e.g. PM5326
Ri=50Ω
DUT
Bandpass
250Hz-15kHz
e.g. 7122 707 48001
LF Voltmeter
e.g. PM2534
Distortion meter
e.g. ST1700B

Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilottone (19kHz, 38kHz).

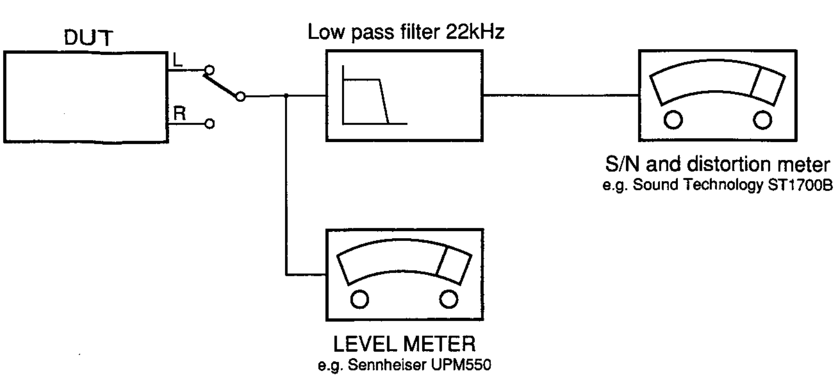
Tuner AM (MW,LW)


DUT
Bandpass
250Hz-15kHz
e.g. 7122 707 48001
LF Voltmeter
e.g. PM2534
RF Generator
e.g. PM5326
Ri=50Ω
Frame aerial
e.g. 7122 707 89001
Distortion meter
e.g. ST1700B

To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday´s cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

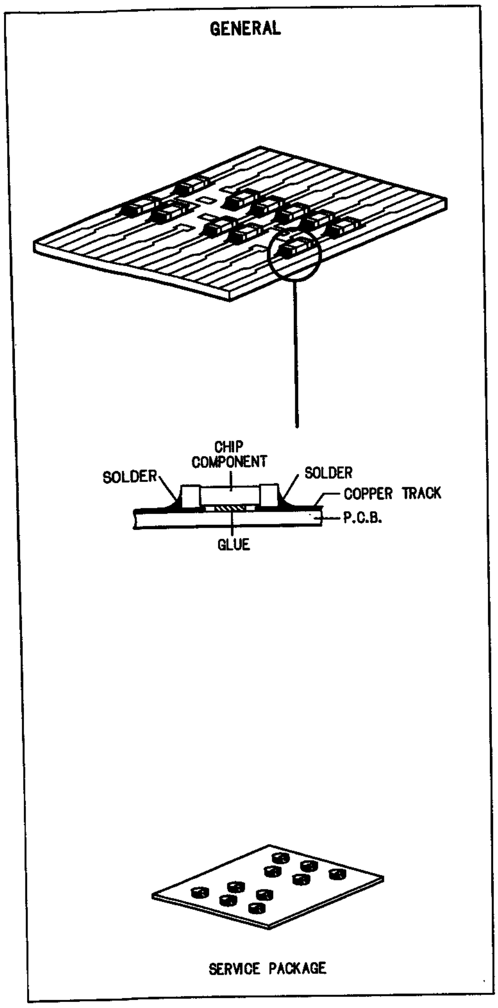
CD

Use Audio Signal Disc SBC429   4822 397 30184 (replaces test disc 3)
L.P.F. = 13th order filter   4822 395 30204

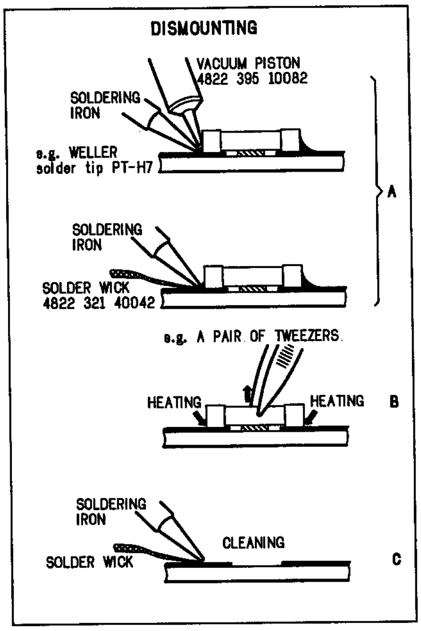

DUT
L
R
Low pass filter 22kHz
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550

HANDLING CHIP COMPONENTS

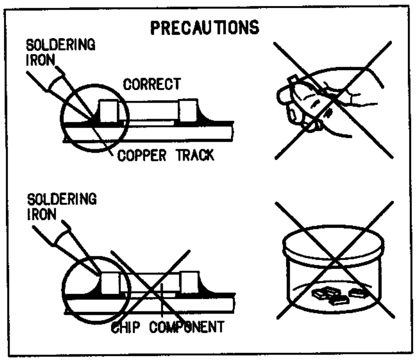
GENERAL


CHIP COMPONENT
SOLDER
SOLDER
COPPER TRACK
P.C.B.
GLUE
SERVICE PACKAGE

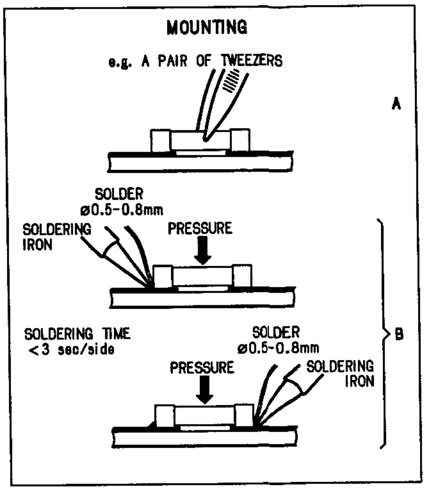
DISMOUNTING


VACUUM PISTON
4822 395 10082
SOLDERING IRON
e.g. WELLER solder tip PT-H7
A
SOLDERING IRON
SOLDER WICK
4822 321 40042
e.g. A PAIR OF TWEEZERS
HEATING
HEATING
B
SOLDERING IRON
SOLDER WICK
CLEANING
C

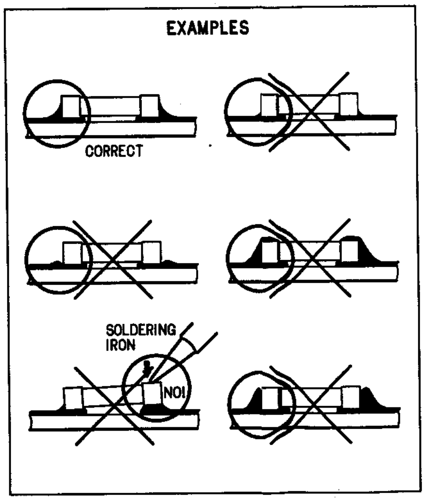
PRECAUTIONS


SOLDERING IRON
CORRECT
COPPER TRACK
SOLDERING IRON
CHIP COMPONENT

MOUNTING


e.g. A PAIR OF TWEEZERS
A
SOLDER
ø0.5-0.8mm
SOLDERING IRON
PRESSURE
SOLDERING TIME
<3 sec/side
SOLDER
ø0.5-0.8mm
PRESSURE
SOLDERING IRON
B

EXAMPLES


CORRECT
SOLDERING IRON
NO!

(GB) WARNING

All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance. Keep components and tools at this potential.

(F) ATTENTION

Tous les IC et beaucoup d´autres semi-conducteurs sont sensibles aux décharges statiques (ESD). Leur longévite pourrait être considérablement écourtée par le fait qu´aucune précaution nést prise à leur manipulation.
Lors de réparations, s´assurer de bien être relié au même potentiel que la masse de l´appareil et enfileer le bracelet serti d´une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l´on utilise soient également à ce potentiel.

ESD

(D) WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kann die Lebensdauer drastisch reduzieren.
Sorgen Sie dafür, daß sie im Reparaturfall über ein Pulsarmband mit Widerstand mit dem Massepotential des Gerätes verbunden sind.
Halten Sie Bauteile und Hilfsmittel ebenfalls auf diesem Potential.

(NL) WAARSCHUWING

Alle IC´s en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderm. Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione. Durante le riparationi occorre quindi essere collegato allo stesso potenziale che quello della massa delápparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

(GB)
Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.

(D)
Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Originalzustand des Gerätes darf nicht verändert werden. Für Reparaturen sind Originalersatzteile zu verwenden.

(I)
Le norme di sicurezza estigono che l´apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambiago identici a quelli specificati.

(F)
Les normes de sécurité exigent que l´appareil soit remis à l´état d´origine et que soient utilisées les pièces de rechange identiques à celles spécifiées.

(NL)
Veiligheidsbepalingen vereisen, dat het apparaat in zijn oorspronkeliijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

(S) Varning !

Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

(DK) Advarsel !

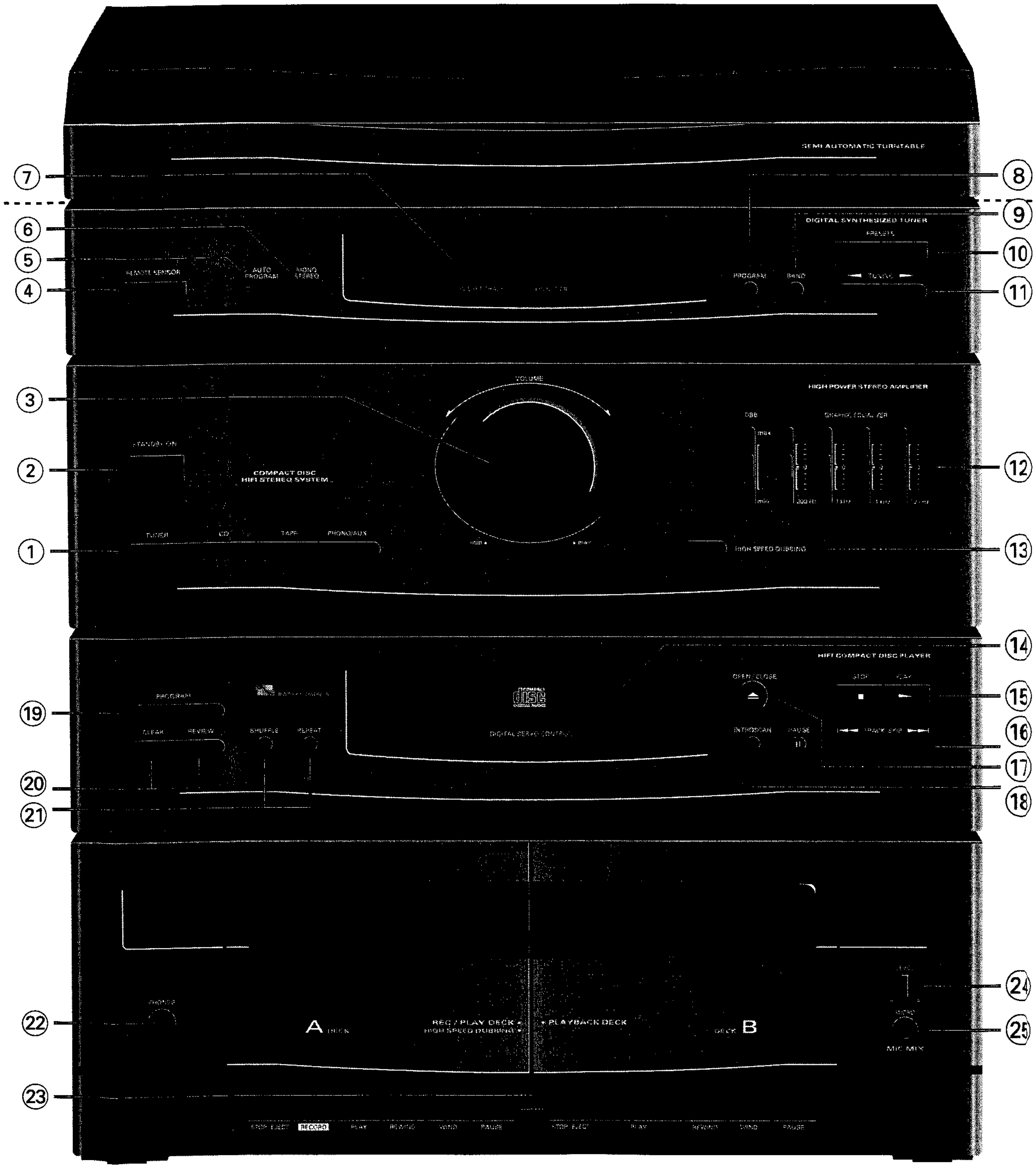
Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

(SF) Varoitus !

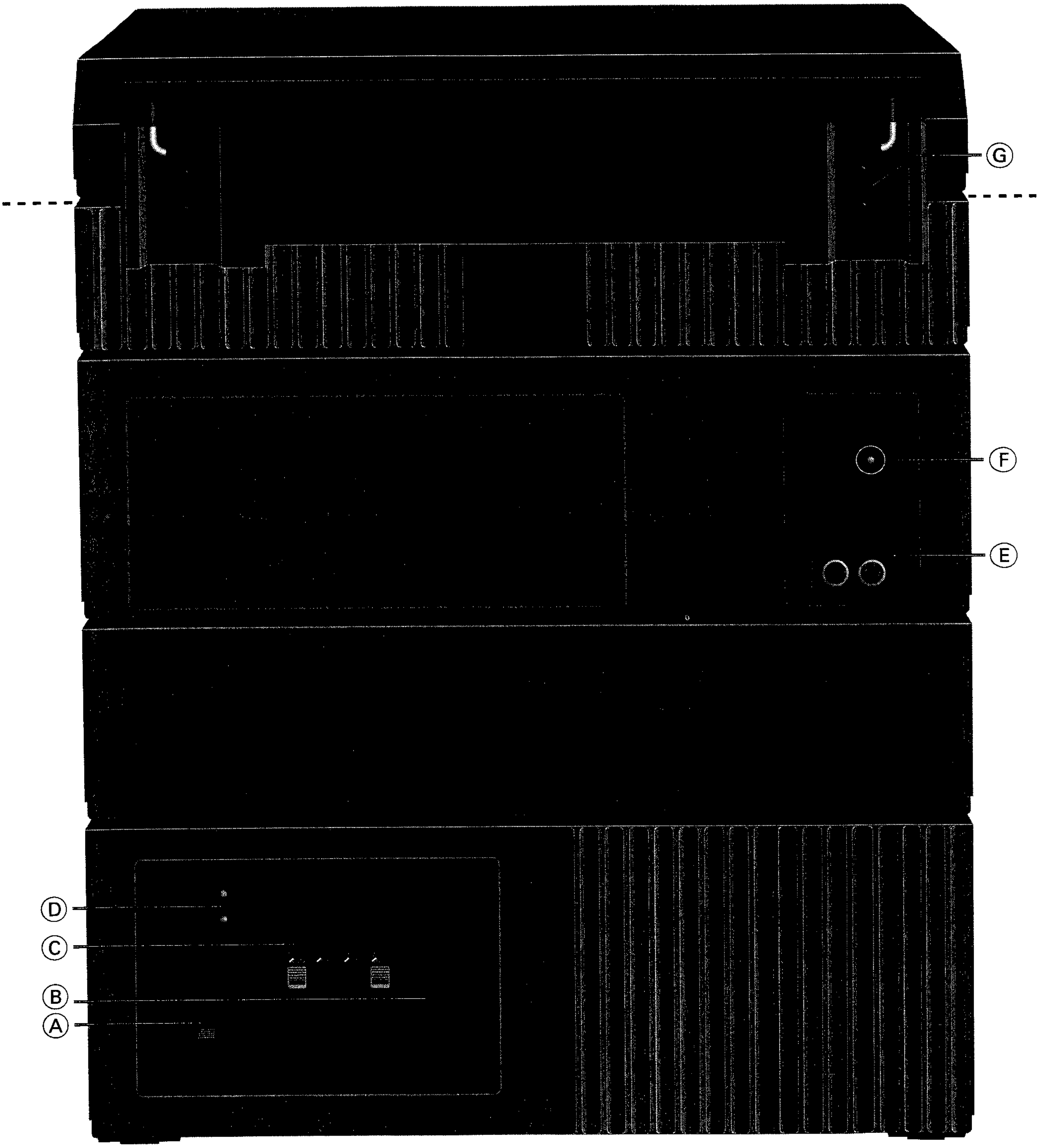
Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen !

(F)
"Pour votre sécurite, ces documents doivent être utilisés par des spécialistes agrées, seuls habilités à réparer votre appareil en panne".

Connection & Controls


SEMI AUTOMATIC TURNTABLE
DIGITAL SYNTHESIZED TUNER
PRESETS
TUNING
PROGRAM
BAND
REMOTE SENSOR
AUTO PROGRAM
MONO STEREO
VOLUME
HIGH POWER STEREO AMPLIFIER
DBB
GRAPHIC EQUALIZER
STANDBY ON
COMPACT DISC HIFI STEREO SYSTEM
TUNER
CD
TAPE
PHONO/AUX
HIGH SPEED DUBBING
HIFI COMPACT DISC PLAYER
OPEN / CLOSE
STOP
PLAY
INTROSCAN
PAUSE
TRACK SKIP
PROGRAM
CLEAR
REVIEW
SHUFFLE
REPEAT
DIGITAL SERVO CONTROL
PHONES
A DECK
REC / PLAY DECK
HIGH SPEED DUBBING
PLAYBACK DECK
DECK B
MIC MIX
STOP EJECT
RECORD
PLAY
REWIND
WIND
PAUSE
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

1	Source selector		see page 25, 26
	Tuner	1440	
	CD	1438	
	Tape	1444	
	Phono/Aux	1437	
2	Stand by	1439	see page 29, 30
3	Volume	3480	see page 25, 26
4	Remote sensor	7422	see page 25, 26
5	Auto Program	1436	see page 29, 30
6	Mono/Stereo	1448	see page 29, 30
7	Display	1415	see page 29, 30
8	Program (Tuner)	1435	see page 29, 30
9	Band	1434	see page 29, 30
10	Presets		see page 29, 30
	Up	1425	
	Down	1426	
11	Tuning		see page 29, 30
	Up	1421	
	Down	1422	
12	Graphic Equalizer		see page 25, 26
	100Hz/DBB	3485	
	300Hz	3484	
	1kHz	3483	
	4kHz	3482	
	10kHz	3481	
13	High Speed Dubbing	1433	see page 29, 30
14	CD Tray		
15	Stop (CD)	1424	see page 29, 30
	Play (CD)	1428	see page 29, 30
16	Track skip (CD)		
	⏮	1431	see page 29, 30
	⏭	1432	see page 29, 30



17	Open/Close (CD)	1427	see page 29, 30
18	Introscan (CD)	1429	see page 29, 30
	Pause (CD)	1430	see page 29, 30
19	Program (CD)	1441	see page 29, 30
20	Clear (CD)	1446	see page 29, 30
21	Review (CD)	1447	see page 29, 30
22	Headphone socket	1410	see page 25, 26
23	Tape transport keys	mechanical	
24	Micro Mix Level	3905	see page 22
25	Microphone socket	1900	see page 22

A	Voltage selector	1260	see page 39
B	Phono supply	1305	see page 37, 38
C	Speaker terminal	1304	see page 37, 38
D	Mains socket	1255	se page 39
E	Aux / Phono sockets	1408	see page 25, 26
F	FM aerial socket for ECO 4 Tuner	1101	see page 40
	FM aerial socket for Tuner 92	1110	see page 46

Service Hints

Version Table (Quick reference)

	AS440 /00, /20,/20P	AS440 /02, /22,/22P	AS440 /05, /25,/25P	AS440 /17, /37,	AS445 /00, /20	AS445 /01, /21	AS445 /05, /25	AS445 /10, /30
Mains cord								
4822 321 10954								x
4822 321 10831	x	x			x	x		
4822 321 10883				x				
4822 321 10918			x				x	
Mains transformer								
4822 146 31239	x	x			x			
4822 146 31234				x				
4822 146 31235						x		x
4822 146 31254			x				x	
Mains socket								
4822 265 31015	x	x	x		x	x	x	x
4822 265 31016				x				
Voltage selector								
4822 272 10269						x		x
IR Remote control								
4822 218 10513	x	x	x	x	x	x	x	x
Loudspeaker box								
4822 445 10359	x	x	x		x		x	
4822 445 10361				x				
4822 445 10362						x		x
Tuner								
ECO4 Tuner	x		x	x	x	x	x	x
Tuner 92		x						
Record player								
DL-40					x	x	x	x
Micro Mix function								
available						x		x

Service tools

TORX screwdriver set SBC 163	4822 395 50145
Audio signal disc SBC 429	4822 397 30184
Test disc 5 (disc without errors) **Test disc 5A** (disc with dropout errors, black spots and finger prints) SBC 426/426A	4822 397 30096
Burn in test disc (65 min. 1kHz signal at -30dB level without "pause")	4822 397 30155
Universal **test cassette Fe** SBC 420	4822 397 30071
Universal **test cassette CrO$_2$** SBC 419	4822 397 30069
Instruction for use (all versions except /37)	4822 736 21737
Instruction for use (for /37)	4822 736 21738

Dismantling of:

CD Brick :see page 52

Front assy

- * Remove top cover as shown in picture 1.
- * Remove right side of the cabinet (10 screws)
- * Remove 3 bottom screws and 3 screws from left side wall on front side.
- * Remove 1 screw to CD metal support on rear.
- * Release 2 snaps (bottom-front) and turn whole front assy aside.

Tape Transports

- * Separate Front assy as described above
- * Loosen Recorder assy (6 screws)

Power Board

- * Remove top cover as shown in picture 1
- * Remove rear part of cabinet (20 screws).
- * Loosen power board (4 screws).
- * Take power board and place it behind the set.

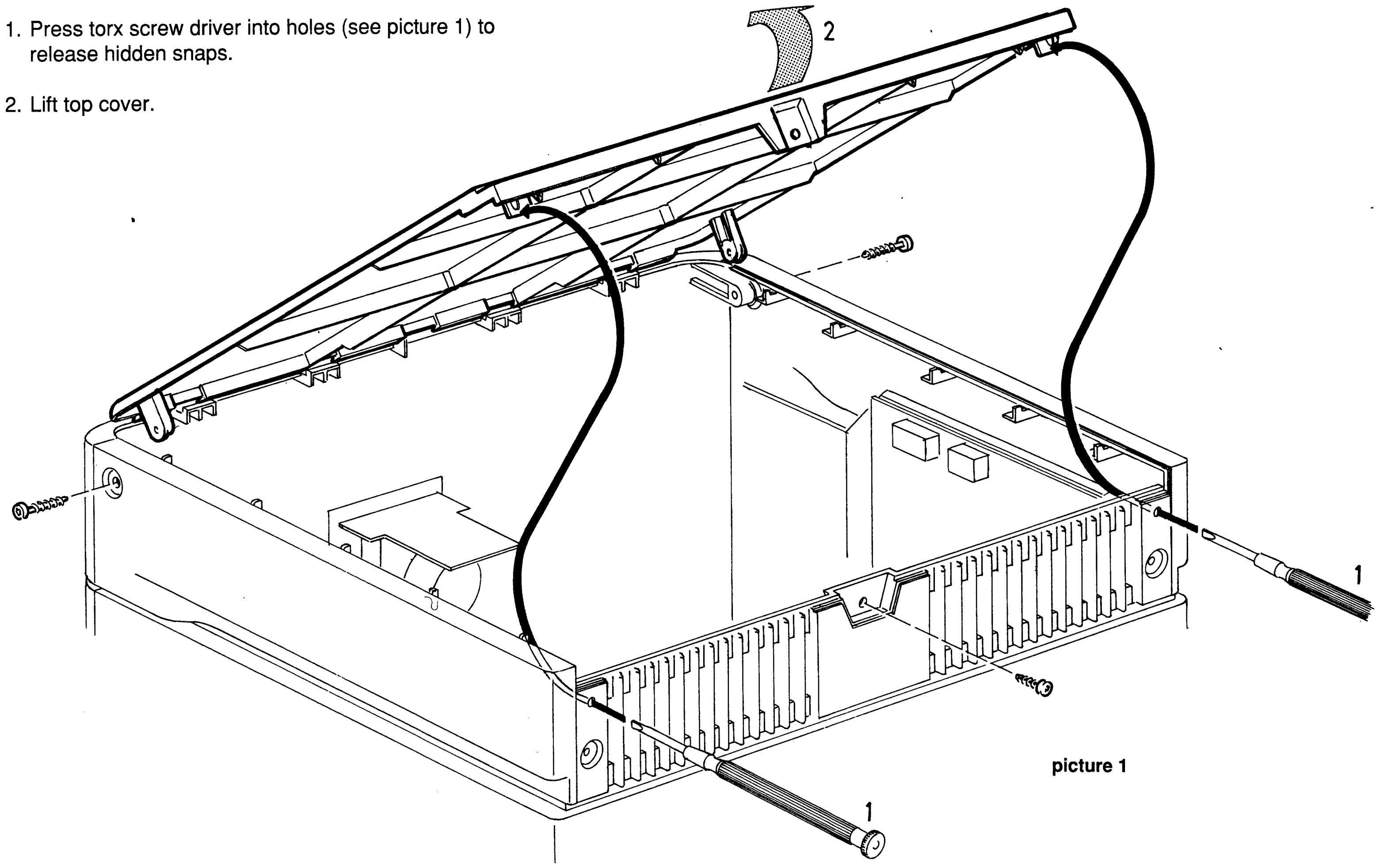
Remarks : Cable to headphone socket has to be disconnected.
Remove CD brick if necessary.

Dismantling Hints

Dismantling of Top Cover

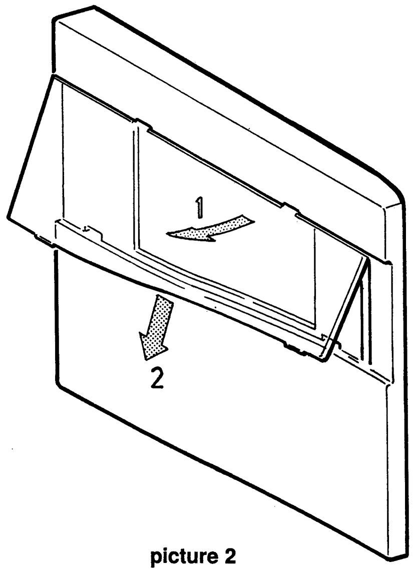
Remove 3x screws.

1. Press torx screw driver into holes (see picture 1) to release hidden snaps.
2. Lift top cover.



picture 1

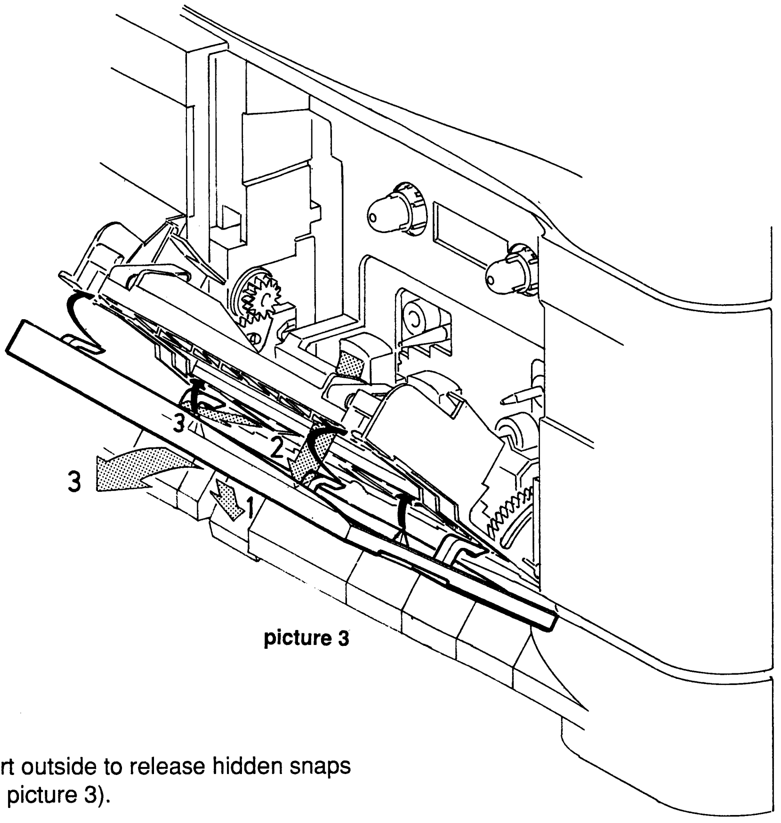
Dismantling Window of Cassette Door



picture 2

1) Press the window outside as shown in picture 2. You don´t need any tool.

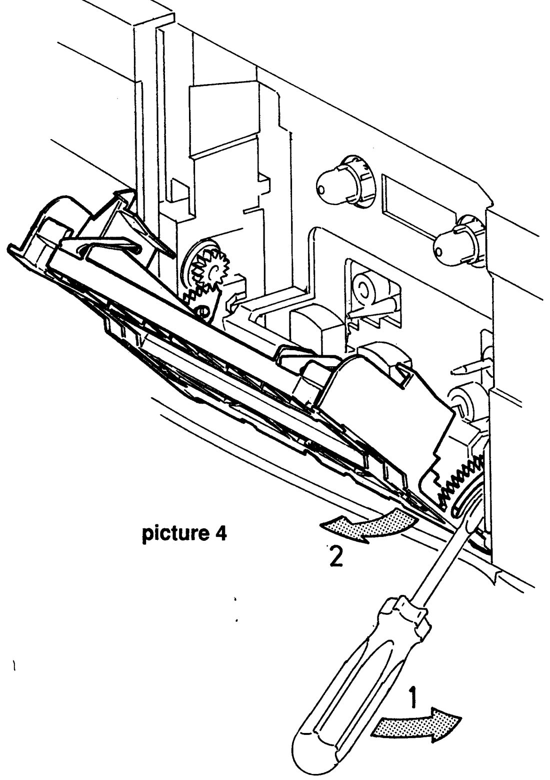
Dismantling Cassette Door Ornamental Part



picture 3

1) Open cassette door.
2) Press ornamental part outside to release hidden snaps (see black arrows on picture 3).
3) Pull ornamental part upwards.

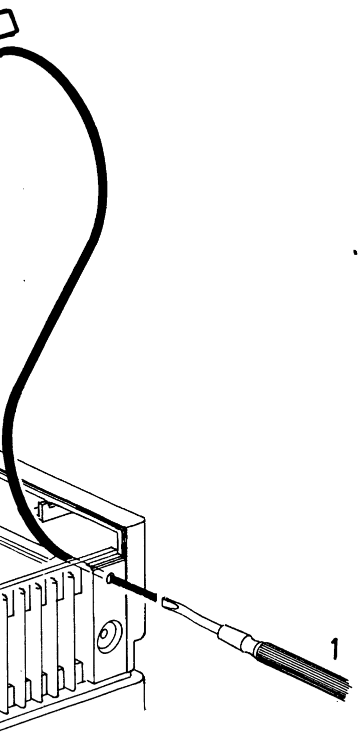
Dismantling Cassette Door Technical Part



picture 4

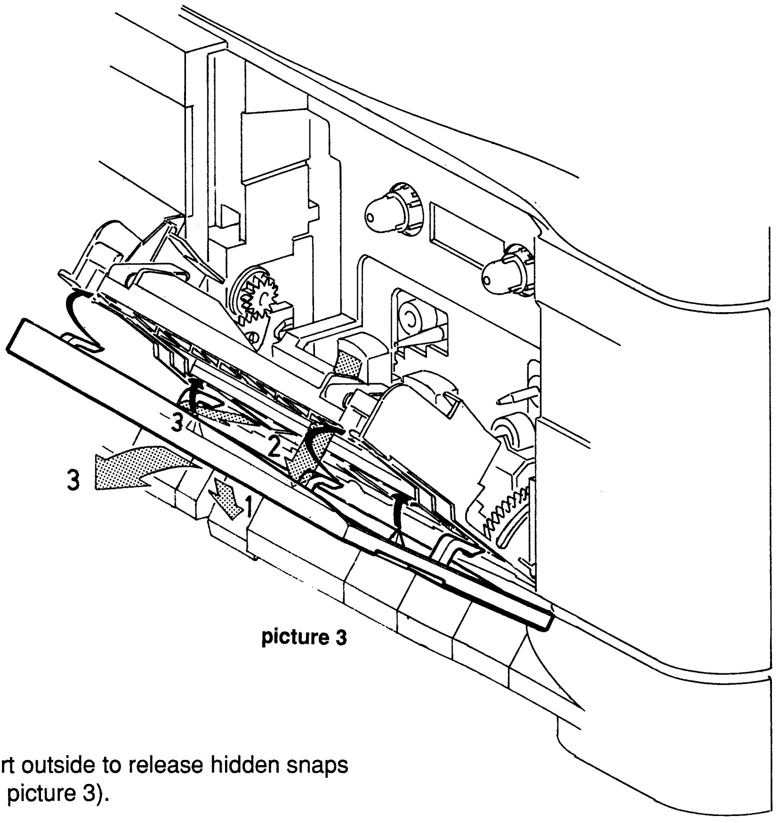
Remove ornamental part first.

1) Bend tooth segment with a screw driver to release snap as shown in picture 4.
2) Pull cassette door outside.



icture 1

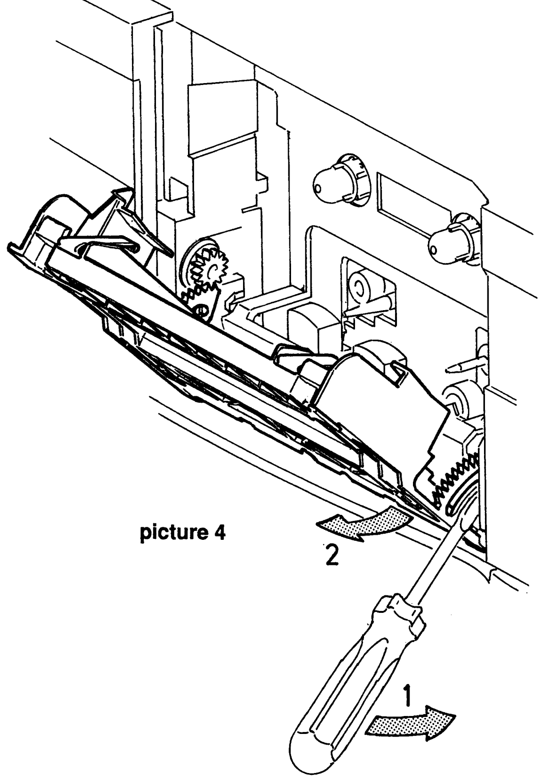
Dismantling Cassette Door Ornamental Part



picture 3

1) Open cassette door.
2) Press ornamental part outside to release hidden snaps (see black arrows on picture 3).
3) Pull ornamental part upwards.

Dismantling Cassette Door Technical Part

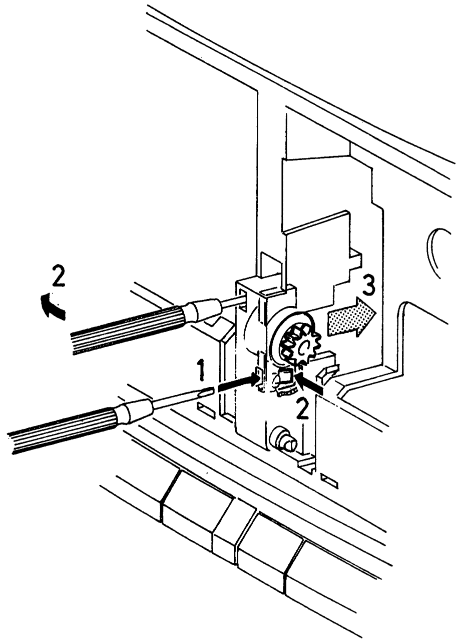


picture 4

Remove ornamental part first.

1) Bend tooth segment with a screw driver to release snap as shown in picture 4.
2) Pull cassette door outside.

Dismantling of Damper



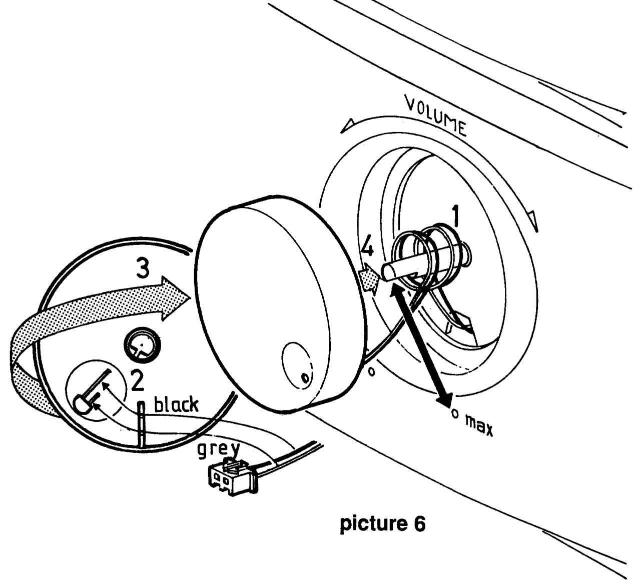
picture 5

Remove Tape Transports and bracket (506) first.

1+2) Release two snaps as shown in picture 5.

3) Pull damper outside.

Mounting of Volume Knob



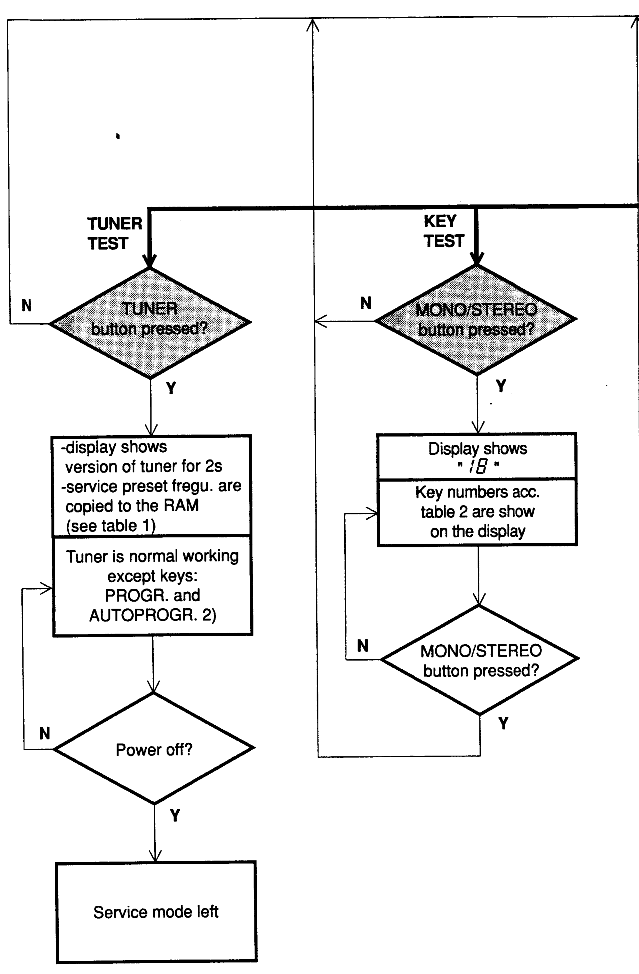
picture 6

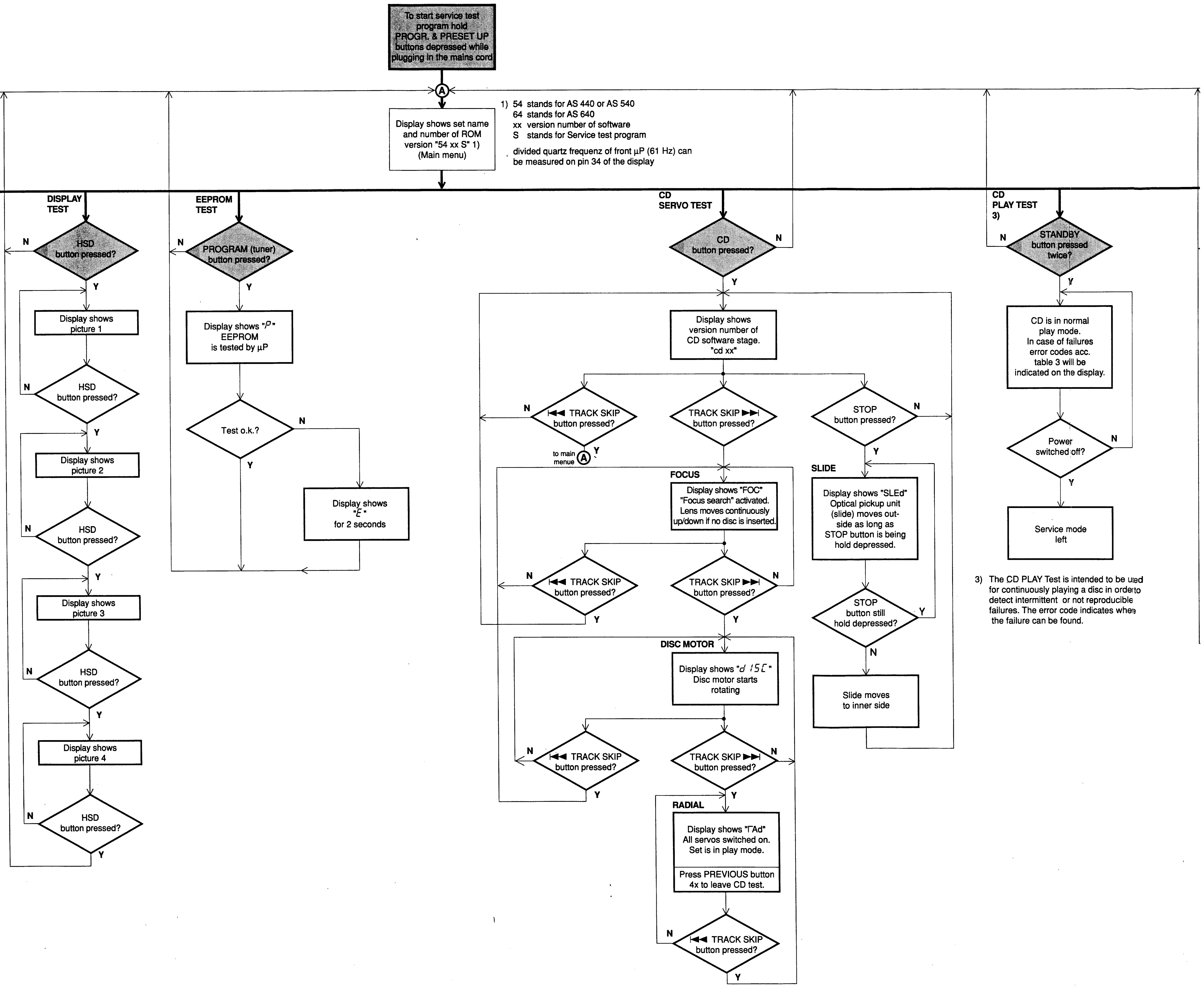
1) Turn Volume pot to max. (clockwise)
2) Pay attention to the polarity of the LED.
3) Turn the cable two times clockwise onto the axle.
4) Insert the knob.

SERVICE TEST PROGRAM

The service test programm can be left:

- **at each step:** by switching power off (disconnect mains)
- **from service main menu:**
  by pressing the Standby button twice the set is switched
  to normal working mode except: * in TUNER mode still the service preset
  frequencies are available.
  * in CD mode the error codes will be displayed.


TUNER
TEST
N
TUNER
button pressed?
Y
-display shows
version of tuner for 2s
-service preset fregu. are
copied to the RAM
(see table 1)
Tuner is normal working
except keys:
PROGR. and
AUTOPROGR. 2)
N
Power off?
Y
Service mode left
KEY
TEST
N
MONO/STEREO
button pressed?
Y
Display shows
"18"
Key numbers acc.
table 2 are show
on the display
N
MONO/STEREO
button pressed?
Y

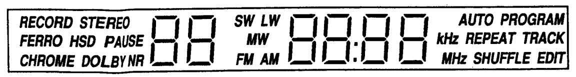

To start service test
program hold
PROGR. & PRESET UP
buttons depressed while
plugging in the mains cord
A
Display shows set name
and number of ROM
version "54 xx S" 1)
(Main menu)
DISPLAY
TEST
N
HSD
button pressed?
Y
Display shows
picture 1
N
HSD
button pressed?
Y
Display shows
picture 2
N
HSD
button pressed?
Y
Display shows
picture 3
N
HSD
button pressed?
Y
Display shows
picture 4
N
HSD
button pressed?
Y
EEPROM
TEST
N
PROGRAM (tuner)
button pressed?
Y
Display shows "P"
EEPROM
is tested by µP
Test o.k.?
N
Y
Display shows
"E"
for 2 seconds
CD
SERVO TEST
CD
button pressed?
N
Y
Display shows
version number of
CD software stage.
"cd xx"
N
⏮ TRACK SKIP
button pressed?
Y
to main
menue
A
TRACK SKIP ⏭
button pressed?
STOP
button pressed?
N
Y
FOCUS
Display shows "FOC"
"Focus search" activated.
Lens moves continuously
up/down if no disc is inserted.
N
⏮ TRACK SKIP
button pressed?
Y
TRACK SKIP ⏭
button pressed?
N
Y
DISC MOTOR
Display shows "dISC"
Disc motor starts
rotating
N
⏮ TRACK SKIP
button pressed?
Y
TRACK SKIP ⏭
button pressed?
N
Y
RADIAL
Display shows "ΓAd"
All servos switched on.
Set is in play mode.
Press PREVIOUS button
4x to leave CD test.
N
⏮ TRACK SKIP
button pressed?
Y
SLIDE
Display shows "SLEd"
Optical pickup unit
(slide) moves out-
side as long as
STOP button is being
hold depressed.
STOP
button still
hold depressed?
Y
N
Slide moves
to inner side
CD
PLAY TEST
3)
N
STANDBY
button pressed
twice?
Y
CD is in normal
play mode.
In case of failures
error codes acc.
table 3 will be
indicated on the display.
Power
switched off?
N
Y
Service mode
left

1) 54 stands for AS 440 or AS 540
64 stands for AS 640
xx version number of software
S stands for Service test program

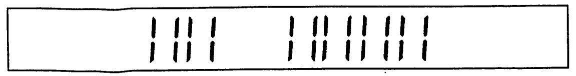
divided quartz frequenz of front µP (61 Hz) can
be measured on pin 34 of the display

2) Preset frequencies of table 1 can be used
as in normal tuner mode.
If fieldstregth is high enough "PROGRAM" flag will light.
Preset frequencies stored by the customer are still
stored in the EEPROM and can be recalled by a reset
of the µP (switching power off by disconnecting mains cord)

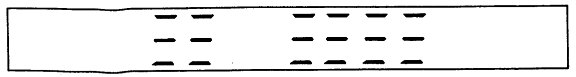
3) The CD PLAY Test is intended to be used
for continuously playing a disc in orderto
detect intermittent or not reproducible
failures. The error code indicates where
the failure can be found.


RECORD STEREO
FERRO HSD PAUSE
CHROME DOLBY NR
88
SW LW
MW
FM AM
88:88
AUTO PROGRAM
kHz REPEAT TRACK
MHz SHUFFLE EDIT

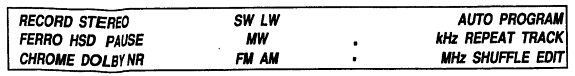
Picture 1



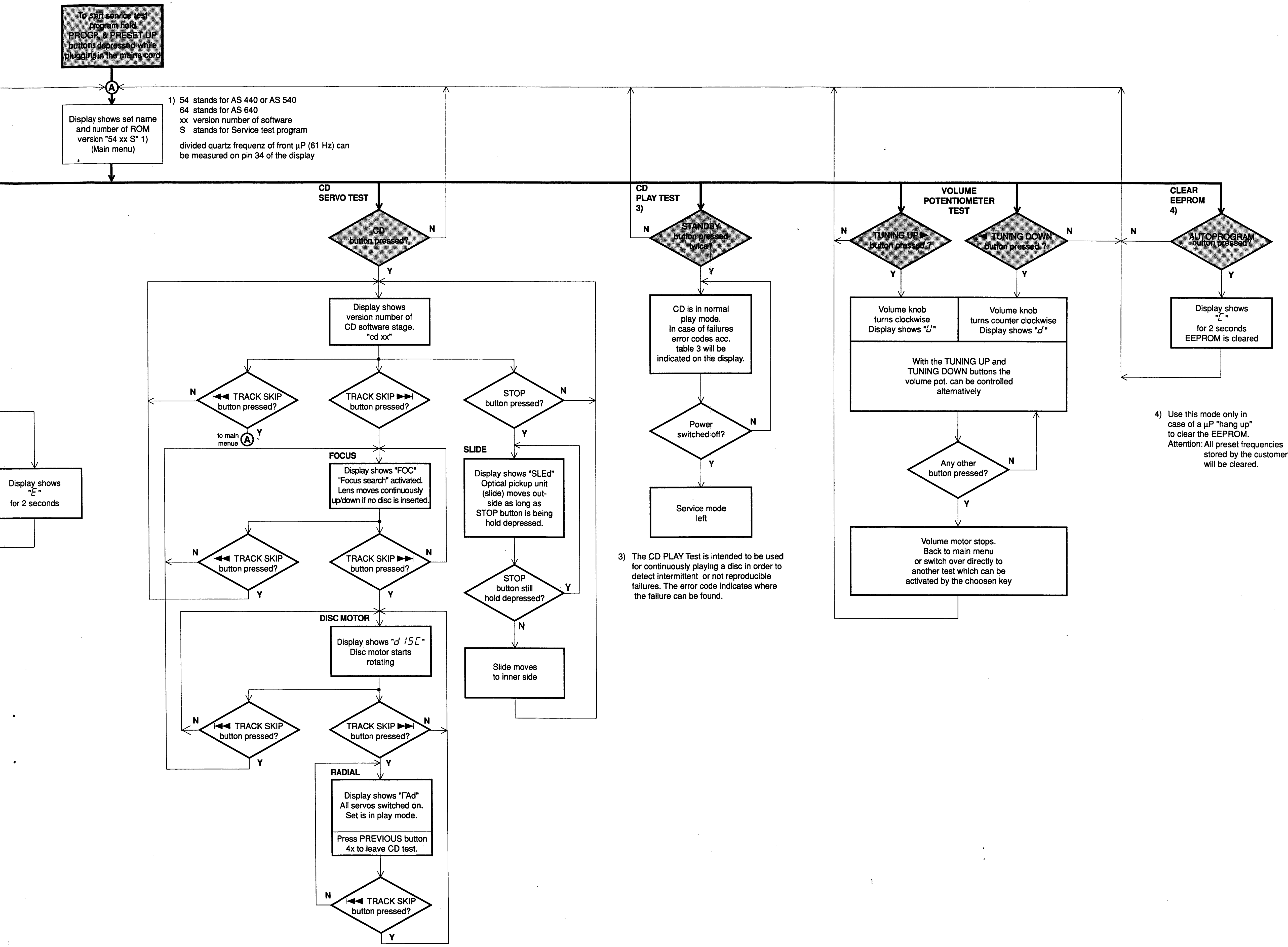
Picture 2



Picture 3


RECORD STEREO
FERRO HSD PAUSE
CHROME DOLBY NR
SW LW
MW
FM AM
AUTO PROGRAM
kHz REPEAT TRACK
MHz SHUFFLE EDIT

Picture 4



1) 54 stands for AS 440 or AS 540
64 stands for AS 640
xx version number of software
S stands for Service test program

divided quartz frequenz of front µP (61 Hz) can be measured on pin 34 of the display

3) The CD PLAY Test is intended to be used for continuously playing a disc in order to detect intermittent or not reproducible failures. The error code indicates where the failure can be found.

4) Use this mode only in case of a µP "hang up" to clear the EEPROM.
Attention: All preset frequencies stored by the customer will be cleared.

To start service test program hold PROGR. & PRESET UP buttons depressed while plugging in the mains cord
A
Display shows set name and number of ROM version "54 xx S" 1) (Main menu)
Display shows "E" for 2 seconds
CD SERVO TEST
CD button pressed?
N
Y
Display shows version number of CD software stage. "cd xx"
◄◄ TRACK SKIP button pressed?
to main menue
A
TRACK SKIP ►► button pressed?
STOP button pressed?
FOCUS
Display shows "FOC" "Focus search" activated. Lens moves continuously up/down if no disc is inserted.
SLIDE
Display shows "SLEd" Optical pickup unit (slide) moves out-side as long as STOP button is being hold depressed.
STOP button still hold depressed?
Slide moves to inner side
DISC MOTOR
Display shows "dISC" Disc motor starts rotating
RADIAL
Display shows "rAd" All servos switched on. Set is in play mode.
Press PREVIOUS button 4x to leave CD test.
CD PLAY TEST 3)
STANDBY button pressed twice?
CD is in normal play mode. In case of failures error codes acc. table 3 will be indicated on the display.
Power switched off?
Service mode left
VOLUME POTENTIOMETER TEST
TUNING UP ► button pressed ?
◄ TUNING DOWN button pressed ?
Volume knob turns clockwise Display shows "U"
Volume knob turns counter clockwise Display shows "d"
With the TUNING UP and TUNING DOWN buttons the volume pot. can be controlled alternatively
Any other button pressed?
Volume motor stops. Back to main menu or switch over directly to another test which can be activated by the choosen key
CLEAR EEPROM 4)
AUTOPROGRAM button pressed?
Display shows "C" for 2 seconds EEPROM is cleared

	VERSION						
	EUR	EAS	USA	EUS	OSE	OSS	
PRESET	Europe 3-band	East Europe 3-band	USA 2-band	Europe 4-band	Oversea 2-band	Oversea 3-band	UNIT
1	87,5	65,81	87,5	87,5	87,5	87,5	MHz
2	108	74	108	108	108	108	MHz
3	98	87,5	98	98	98	98	MHz
4	89,7	108	89,7	89,7	89,7	89,7	MHz
5	93	98	93	93	93	93	MHz
6	104,9	89,7	104,9	104,9	104,9	104,9	MHz
7	522	93	530	522	530	530	kHz
8	1611	104,9	1710	1611	1710	1710	kHz
9	540	522	540	540	540	540	kHz
10	549	1611	550	549	550	550	kHz
11	558	540	560	558	560	560	kHz
12	1494	549	1500	1494	1500	1500	kHz
13	153	558	1600	153	1600	1600	kHz
14	279	1494	1000	279	1000	3900	kHz
15	156	153		156		12100	kHz
16	198	279		198		4250	kHz
17	270	156		270		8000	kHz
18	999	198		5900		11900	kHz
19		270		18100		1000	kHz
20		999		6200			kHz
21				17000			kHz
22				12000			kHz
23				999			kHz

table 1

Key activated	Display shows	Key activated	Display shows
Tuning up	01	Autoprogram	17
Tuning down	03	Mono / Stereo	18
Preset up	04	Tuner	19
Preset down	02	Stand by	20
Dolby [1]	05	Tape	21
Band	06	Phono / Aux	22
Program(Tuner)	07	CD	23
Fe/Cr [1]	08	—	—
Introscan	09	Repeat	25
Pause (CD)	10	Shuffle	26
≪ Track skip	11	Review	27
Track skip ≫	12	Clear	28
HS dubbing	13	—	—
Open/Close	14	Edit [1]	30
Stop (CD)	15	—	—
Play (CD)	16	Program (CD)	32

table 2

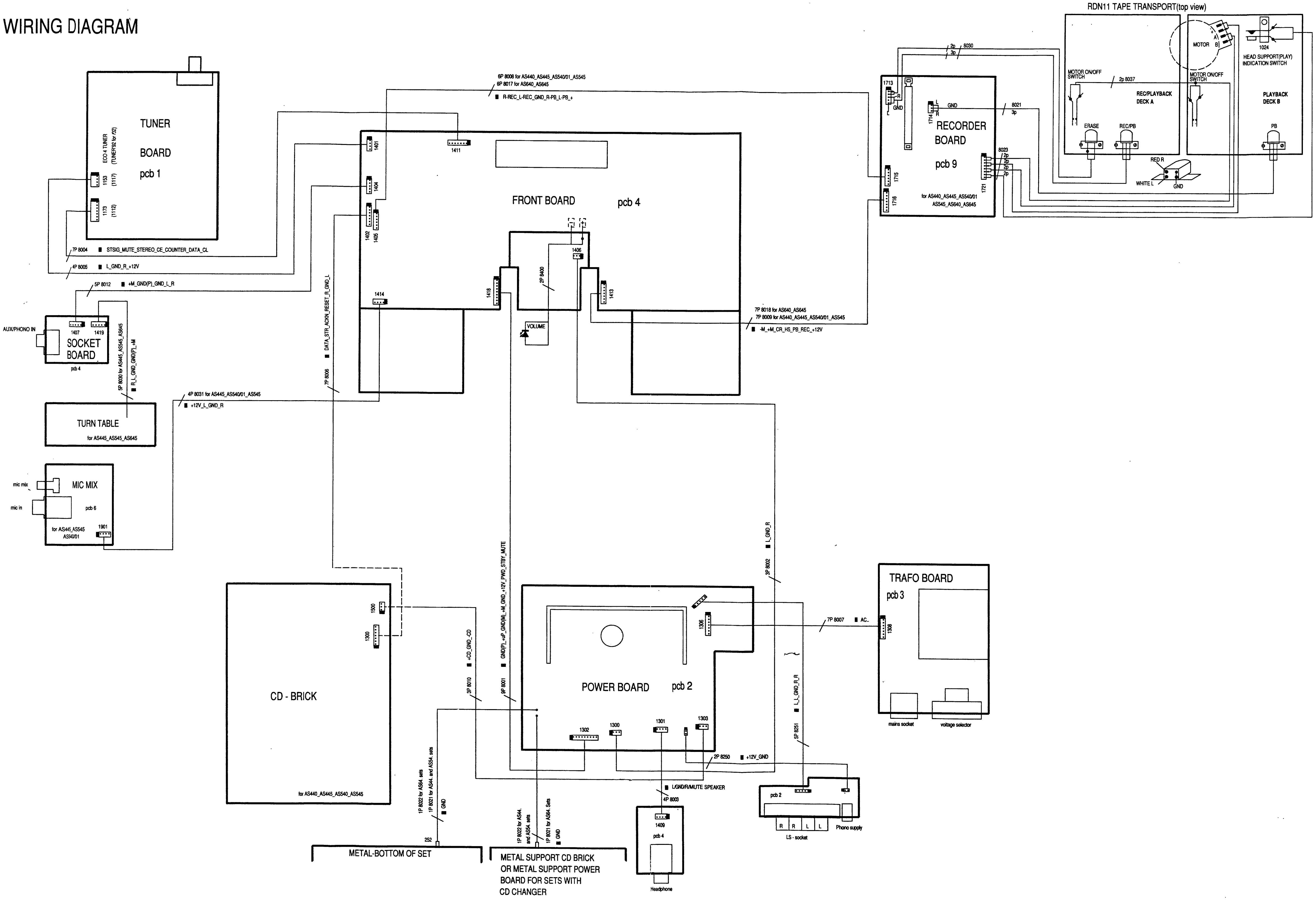
If a key is activated at the remote control rC is shown additionally to the key number as long as the key is hold depressed.

1) key not available in all versions.

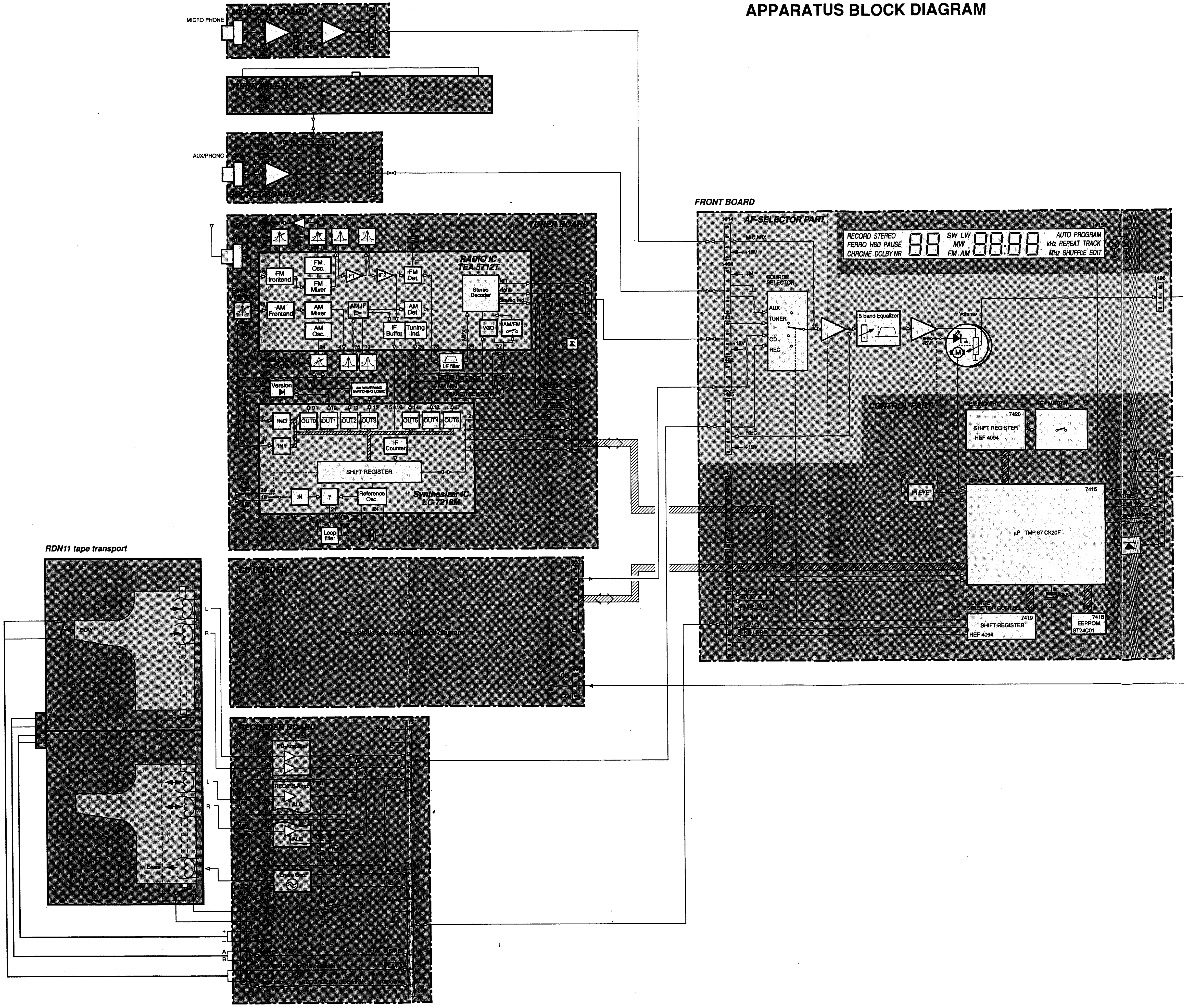
Error code shown on the display		Description
Er	1002	Focus error
Er	1007	Subcode error, no valid subcode
Er	1008	TOC error, out of lead-in area while reading TOC
Er	1009	CD4 + decoder error
Er	1010	Radial error
Er	1012	Fatal sledge error
Er	1013	Turntable motor error
Er	1030	Too many grooves to jump
Er	1031	Search error
Er	1032	Search binary error
Er	1033	Search index error
Er	1034	Search time error
Er	1037	Selector error
Er	1050	Edit calculation error
Er	1051	Edit track count error
Er	1052	Edit Optimal error

table 3

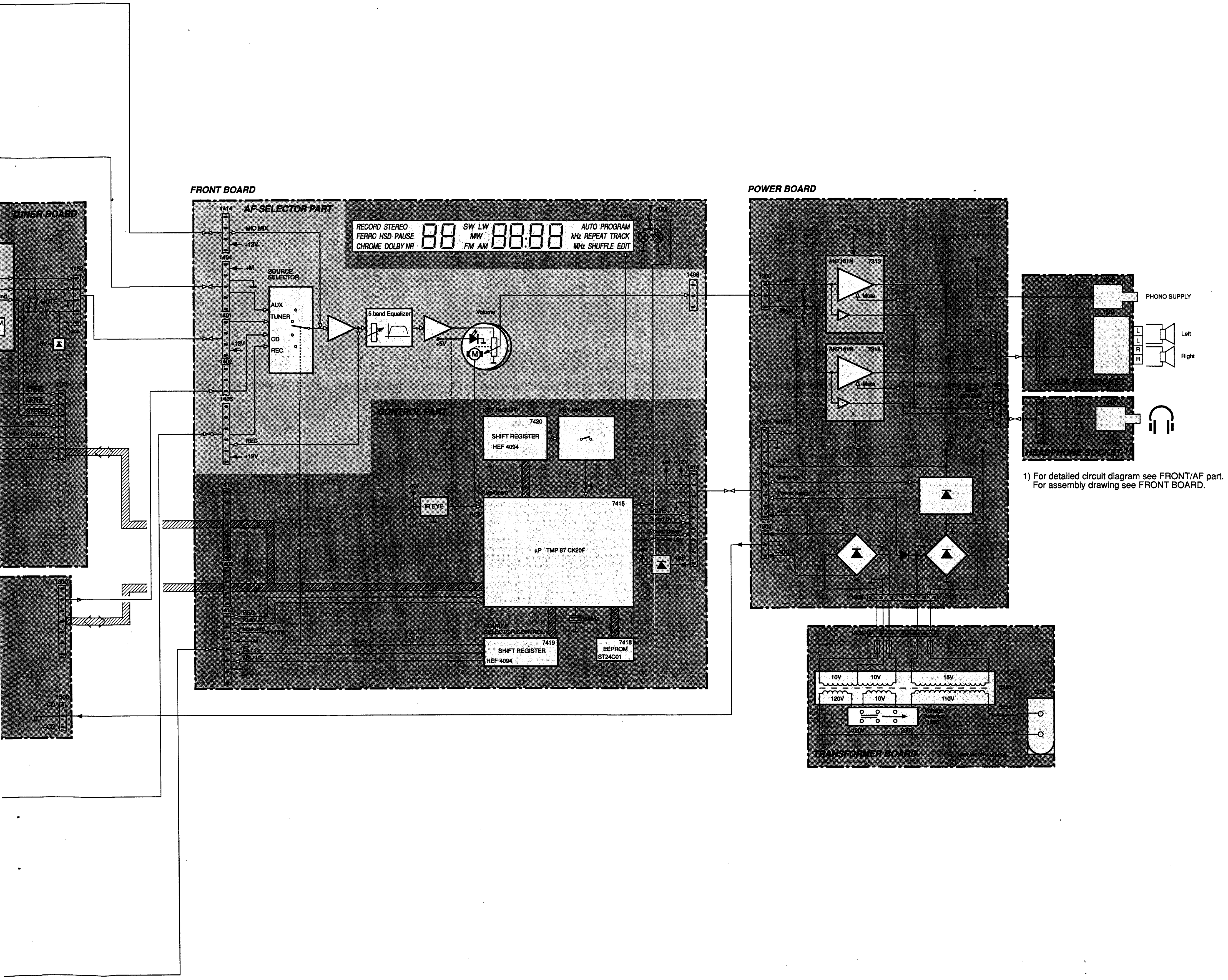
WIRING DIAGRAM


RDN11 TAPE TRANSPORT(top view)
MOTOR
A
B
1024
HEAD SUPPORT(PLAY) INDICATION SWITCH
MOTOR ON/OFF SWITCH
2p 8037
REC/PLAYBACK DECK A
MOTOR ON/OFF SWITCH
PLAYBACK DECK B
ERASE
REC/PB
PB
RED R
WHITE L
GND
2p
3p
8030
1713
R
GND
L
1714
GND
8021
3p
RECORDER BOARD
pcb 9
8023
2p
2p
2p
2p
1715
1716
1721
for AS440_AS445_AS540/01 AS545_AS640_AS645
TUNER BOARD
pcb 1
ECO 4 TUNER
(TUNER'92 for /32)
1153
(1117)
1173
(1112)
6P 8008 for AS440_AS445_AS540/01_AS545
6P 8017 for AS640_AS645
R-REC_L-REC_GND_R-PB_L-PB_+
1401
1411
1404
1402
1405
FRONT BOARD
pcb 4
1406
2P 8400
1418
1413
1414
VOLUME
7P 8004
STSIG_MUTE_STEREO_CE_COUNTER_DATA_CL
4P 8005
L_GND_R_+12V
5P 8012
+M_GND(P)_GND_L_R
AUX/PHONO IN
1407
1419
SOCKET BOARD
pcb 4
5P 8030 for AS445_AS545_AS645
R_L_GND_GND(P)_+M
DATA_STR_ACKN_RESET_R_GND_L
7P 8006
7P 8018 for AS640_AS645
7P 8009 for AS440_AS445_AS540/01_AS545
-M_+M_CR_HS_PB_REC_+12V
4P 8031 for AS445_AS540/01_AS545
+12V_L_GND_R
TURN TABLE
for AS445_AS545_AS645
mic mix
mic in
MIC MIX
pcb 6
for AS445_AS545 AS540/01
1901
CD - BRICK
1500
1300
for AS440_AS445_AS540_AS545
+CD_GND_-CD
3P 8010
GND(P)_+uP_GND(M)_+M_GND_+12V_PWD_STBY_MUTE
9P 8001
L_GND_R
3P 8002
1306
POWER BOARD
pcb 2
1302
1300
1301
1303
2P 8250
+12V_GND
L_L_GND_R_R
5P 8251
7P 8007
AC..
TRAFO BOARD
pcb 3
1308
mains socket
voltage selector
L/GND/R/MUTE SPEAKER
4P 8003
1409
pcb 4
Headphone
pcb 2
R
R
L
L
Phono supply
LS - socket
1P 8022 for AS64. sets
1P 8021 for AS44. and AS54. sets
GND
252
METAL-BOTTOM OF SET
1P 8022 for AS44. and AS54. sets
1P 8021 for AS64. Sets
GND
METAL SUPPORT CD BRICK OR METAL SUPPORT POWER BOARD FOR SETS WITH CD CHANGER

APPARATUS BLOCK DIAGRAM


MICRO MIX BOARD
MICRO PHONE
1901
+12V
MIX LEVEL
TURNTABLE DL 40
1418
AUX/PHONO
1402
+M
SOCKET BOARD
TUNER BOARD
to Synth.
FM-Osc.
Disc.
Ferrite Antenna
RADIO IC
TEA 5712T
FM frontend
FM Osc.
FM Mixer
IF1
IF2
FM Det.
AM Frontend
AM Mixer
AM Osc.
AM IF
AM Det.
IF Buffer
Tuning Ind.
Stereo Decoder
left
right
Stereo Ind.
MPX
VCO
AM/FM
MUTE
+5V
LF filter
AM-Osc. to Synth.
Version
AM WAVEBAND SWITCHING LOGIC
MONO / STEREO
AM / FM
SEARCH SENSITIVITY
STOP
MUTE
STEREO
CE
Counter
Data
CL
INO
IN1
OUT0
OUT1
OUT2
OUT3
OUT5
OUT4
OUT6
IF Counter
SHIFT REGISTER
FM Osc.
AM Osc.
:N
Reference Osc.
Synthesizer IC
LC 7218M
Loop filter
+V
V Loop
RDN11 tape transport
PLAY
Erase
L
R
CD LOADER
for details see separate block diagram
+CD
-CD
RECORDER BOARD
+12V
PB-Amplifier
REC/PB-Amp.
ALC
REC L
REC R
Erase Osc.
Fe/Cr
REC
+M
+
−
A
B
NB/HS
PLAY BACK info (HS possible)
PLAY A
Tape info
RECORDER MODE HIGH
tape info
FRONT BOARD
AF-SELECTOR PART
1414
MIC MIX
+12V
1404
+M
SOURCE SELECTOR
AUX
TUNER
CD
REC
1401
1402
1405
5 band Equalizer
+5V
Volume
M
RECORD STEREO
FERRO HSD PAUSE
CHROME DOLBY NR
SW LW
MW
FM AM
AUTO PROGRAM
kHz REPEAT TRACK
MHz SHUFFLE EDIT
1415
1406
CONTROL PART
KEY INQUIRY
KEY MATRIX
7420
SHIFT REGISTER
HEF 4094
IR EYE
Vol.up/down
RC5
7415
µP TMP 87 CK20F
MUTE
stand by
power down
1416
1413
PLAY A
tape info
Fe / Cr
NB / HS
SOURCE SELECTOR CONTROL
7419
SHIFT REGISTER
HEF 4094
8MHz
7418
EEPROM
ST24C01

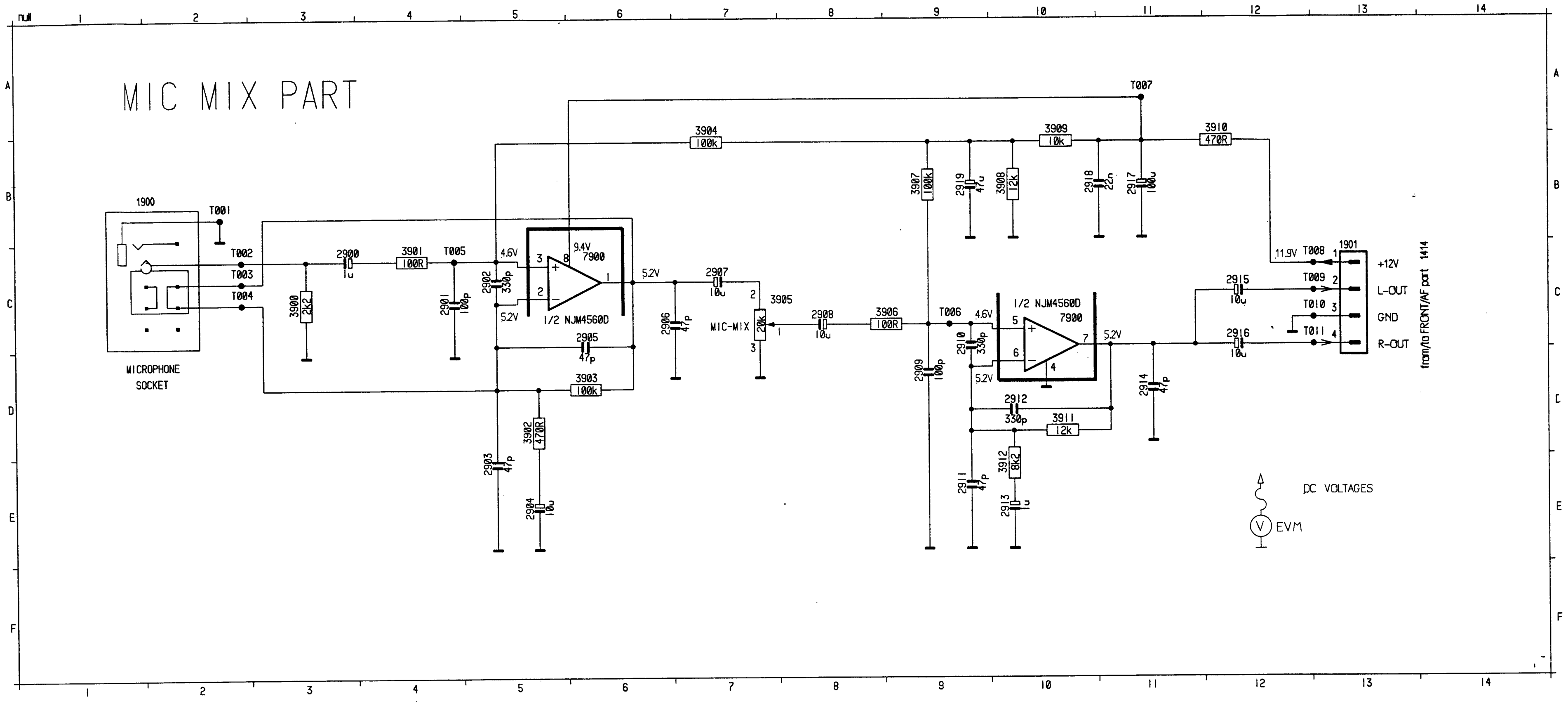
APPARATUS BLOCK DIAGRAM


TUNER BOARD
MUTE
STEREO
FRONT BOARD
AF-SELECTOR PART
1414
MIC MIX
+12V
1404
+M
SOURCE SELECTOR
AUX
TUNER
CD
REC
1401
1402
1405
REC
+12V
5 band Equalizer
Volume
+5V
M
RECORD STEREO
FERRO HSD PAUSE
CHROME DOLBY NR
SW LW
MW
FM AM
AUTO PROGRAM
kHz REPEAT TRACK
MHz SHUFFLE EDIT
1416
+12V
1406
CONTROL PART
KEY INQUIRY
KEY MATRIX
7420
SHIFT REGISTER
HEF 4094
IR EYE
+5V
Vol up/down
RC5
7415
µP TMP 87 CK20F
MUTE
Stand by
Power down
+5V
+M
+12V
1418
1411
1402
REC
PLAY A
tape info
+12V
+M
Fe / Cr
NS / HS
SOURCE SELECTOR CONTROL
8MHz
7419
SHIFT REGISTER
HEF 4094
7418
EEPROM
ST24C01
+CD
-CD
POWER BOARD
+V
AN7161N
7313
Mute
AN7161N
7314
Mute
1300
Left
Right
+12V
Left
Right
1302
MUTE
+12V
Stand by
Power down
+µP
1303
+CD
-CD
1306
1308
PHONO SUPPLY
L
L
R
R
Left
Right
CLICK FIT SOCKET
1409
HEADPHONE SOCKET 1)
10V
10V
15V
120V
10V
110V
5250
5251
1255
Voltage Selector
120V
230V
TRANSFORMER BOARD
not for all versions

1) For detailed circuit diagram see FRONT/AF part.
For assembly drawing see FRONT BOARD.

Micro Mix only in versions with Record Player

1900	B 2	2901	C 4	2904	E 5	2907	C 7	2910	C 9	2913	E10	2916	C12	2919	B 9	3902	D 5	3905	C 7	3908	B10	3911	D10	7900	C10	T003	C 2	T006	C 9	T009	C13
1901	C13	2902	C 5	2905	C 6	2908	C 8	2911	E 9	2914	D11	2917	B11	3900	C 3	3903	D 6	3906	C 9	3909	A10	3912	E10	T001	B 2	T004	C 2	T007	A11	T010	C13
2900	C 3	2903	E 5	2906	C 6	2909	D 9	2912	D10	2915	C12	2918	B10	3901	C 4	3904	A 7	3907	B 9	3910	A12	7900	C 6	T002	C 2	T005	C 4	T008	C13	T011	C13


MIC MIX PART
null
1
2
3
4
5
6
7
8
9
10
11
12
13
14
A
B
C
D
E
F
1900
T001
T002
T003
T004
MICROPHONE
SOCKET
3900
2k2
2900
1u
3901
100R
T005
2901
100p
2902
330p
4.6V
9.4V
7900
5.2V
1/2 NJM4560D
3904
100k
3903
100k
2905
47p
3902
470R
2903
47p
2904
10u
2907
10u
2906
47p
MIC-MIX
3905
20k
2908
10u
3906
100R
3907
100k
2909
100p
2910
330p
T006
T007
2919
47u
3908
12k
3909
10k
2918
22n
2917
100u
3910
470R
1/2 NJM4560D
7900
2912
330p
3911
12k
3912
8k2
2911
47p
2913
1u
2914
47p
11.9V
T008
T009
T010
T011
1901
2915
10u
2916
10u
+12V
L-OUT
GND
R-OUT
from/to FRONT/AF part 1414
DC VOLTAGES
EVM

1900 B 1	2905 A 3	2912 B 3	2919 B 3	3906 C 2	7900 B 2
1901 C 3	2906 A 2	2913 C 3	3900 A 2	3907 B 2	9900 B 2
2900 C 2	2907 C 1	2914 B 2	3901 B 3	3908 B 3	9901 C 2
2901 A 2	2908 C 2	2915 C 3	3902 A 2	3909 C 2	9902 A 2
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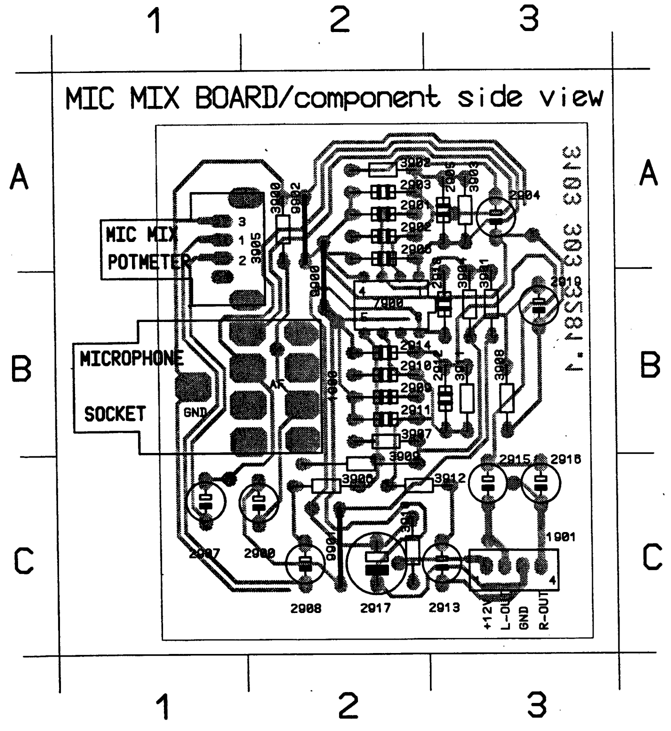
1
2
3
A
B
C
MIC MIX BOARD/component side view
MIC MIX
POTMETER
MICROPHONE
SOCKET
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3103 303 3358.1
7900
2908
2917
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2907
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1901
+12V
L-OUT
GND
R-OUT

3662 C 10	3484 D 11	2463 D 3	0002 A 9
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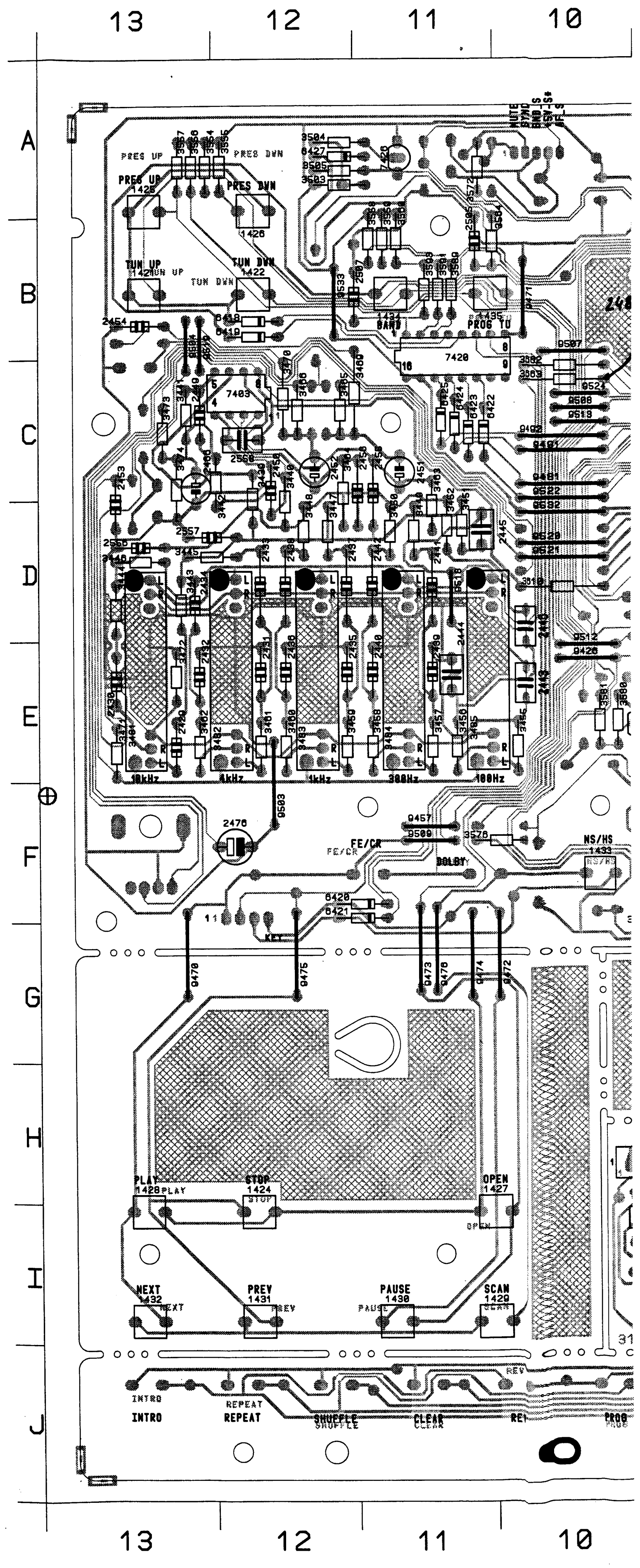
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D
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H
I
J
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1426
PRES DWN
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TUN UP
1421
TUN DWN
1422
PROG TU
10kHz
4kHz
1kHz
300Hz
100Hz
2476
FE/CR
DOLBY
NS/HS
1433
PLAY
1428
STOP
1424
OPEN
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NEXT
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PREV
1431
PAUSE
1430
SCAN
1429
INTRO
REPEAT
SHUFFLE
CLEAR
REV
PROG

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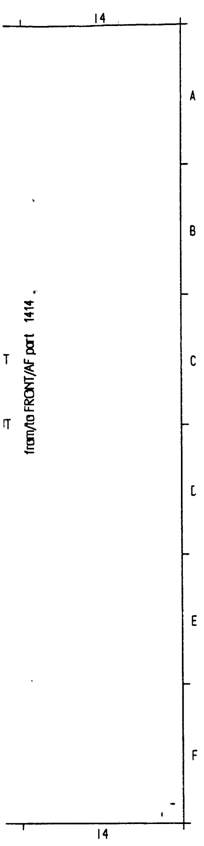

14
from/to FRONT/AF part 1414
A
B
C
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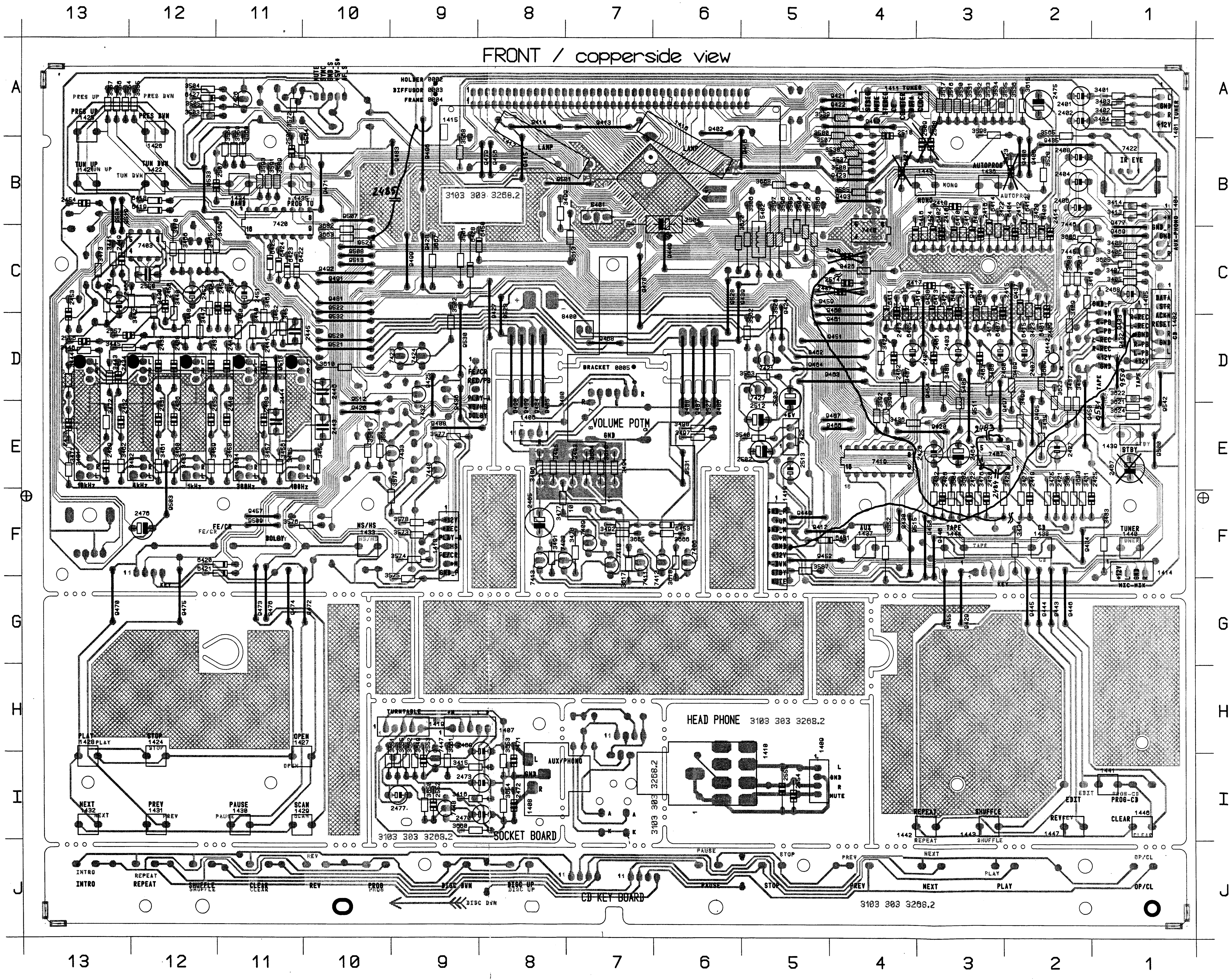
14



FRONT / copperside view
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12
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1
A
B
C
D
E
F
G
H
I
J
HOLDER 0002
DIFFUSOR 0003
FRAME 0004
PRES UP
PRES DWN
TUN UP
TUN DWN
BAND
PROG TU
LAMP
3103 303 3268.2
1415
1411 TUNER
AUTOPROG
MONO
IR EYE
1401 TUNER
AUX-PHONO 1404
CD 1402
GND
+12V
BRACKET 0005
VOLUME POTM
GND
10kHz
3kHz
1kHz
300Hz
100Hz
FE/CR
NS/HS
DOLBY
AUX
TAPE
CD
TUNER
STBY
MIC-MIX
1414
KEY
TURNTABLE
AUX/PHONO
SOCKET BOARD
HEAD PHONE 3103 303 3268.2
L
GND
R
MUTE
PLAY 1428
STOP 1424
OPEN 1427
NEXT 1432
PREV 1431
PAUSE 1430
SCAN 1429
REPEAT 1442
SHUFFLE 1443
REV 1447
EDIT
PROG-CD 1441
CLEAR 1446
INTRO
REPEAT
SHUFFLE
CLEAR
REV
PROG
DISC DWN
DISC UP
CD KEY BOARD
PAUSE
STOP
PREV
NEXT
PLAY
OP/CL
3103 303 3268.2

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1406	E22
1407	L 2
1408	L 8
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2555	J15
2556	G17
2557	C17
2558	C19
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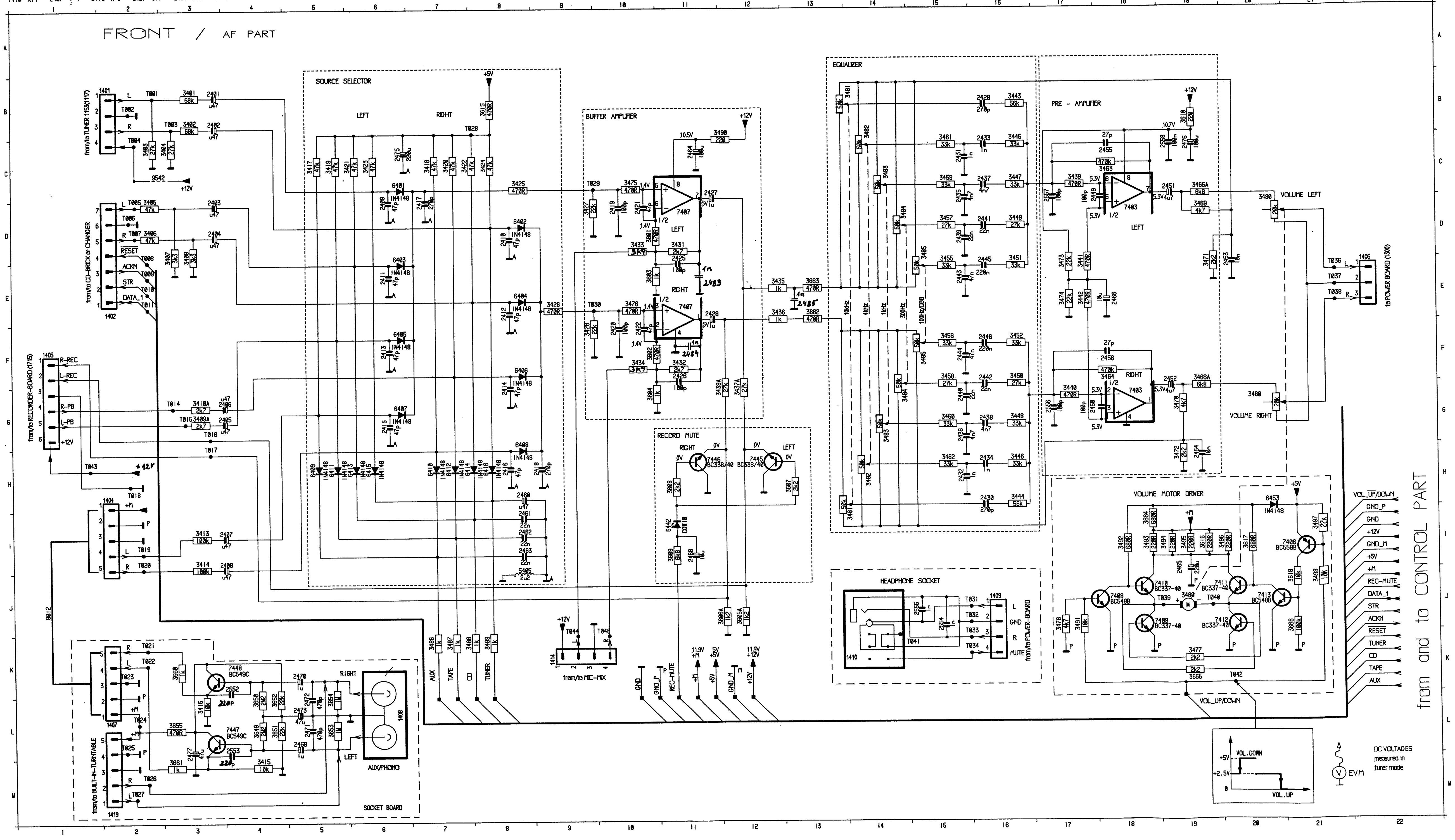
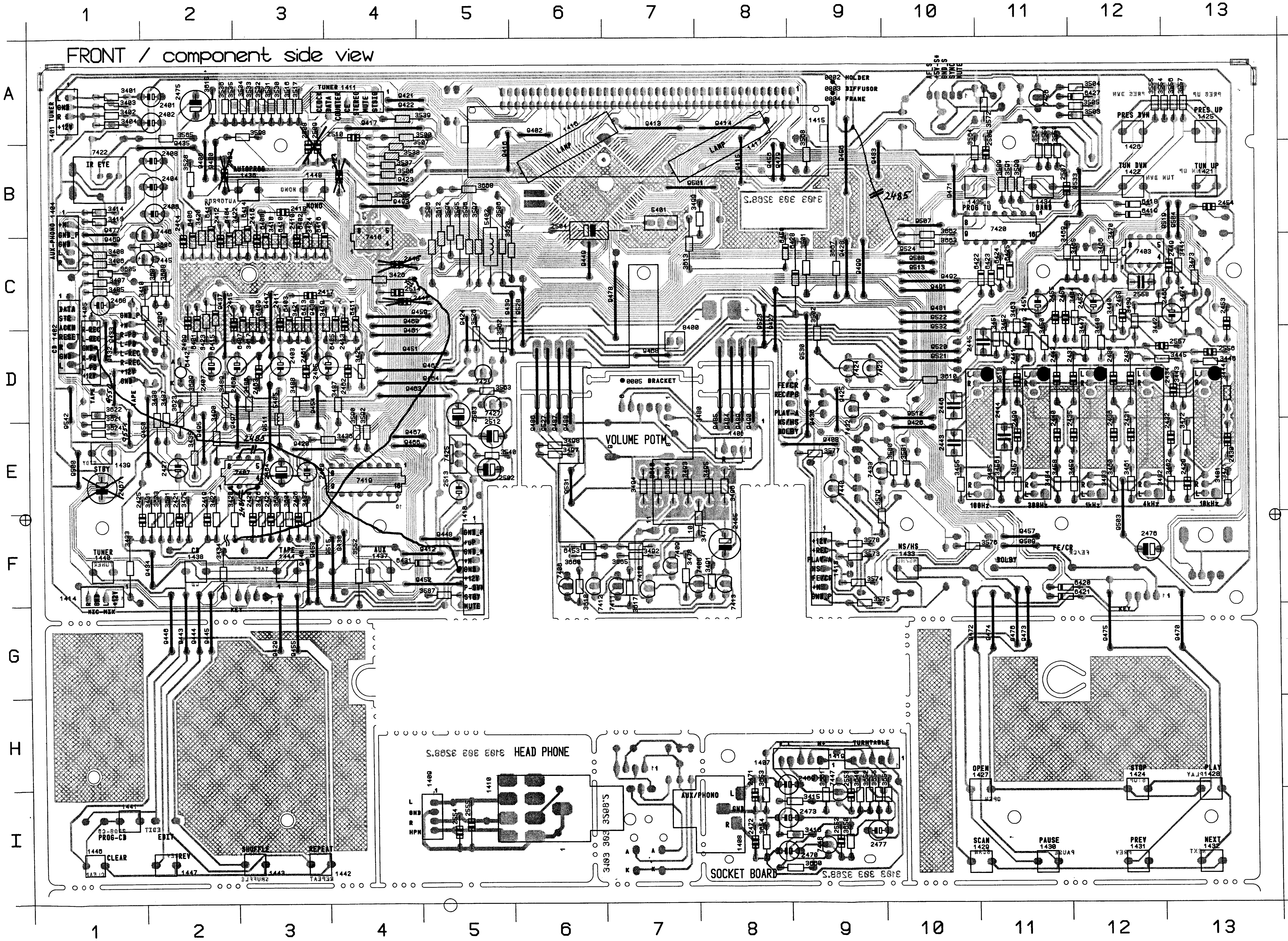
3666	J21
5405	J 8
6401	C 6
6402	D 8
6403	D 6
6404	E 8
6405	F 6
6406	F 8
6407	G 6
6408	G 8
6409	H 5
6410	H 7
6411	H 5
6412	H 7
6413	H 6
6414	H 7
6415	H 6
6416	H 8
6442	I11
6453	H20
6455	H 2
6456	H 3
7403	D18
7403	G18
7406	I21
7407	E11
7407	D11
7408	J18
7409	J18
7410	J18
7411	J20
7412	J20
7413	J20
7445	H12
7446	H11
7447	L 4
7448	K 4
9542	C 2
T001	B 2
T002	B 2
T003	B 3
T004	B 2
T005	C 2
T006	D 2
T007	D 2
T008	D 2
T009	E 2
T010	E 2
T011	E 2
T014	G 3
T015	G 3
T016	G 3
T017	G 3
T018	H 2
T019	I 2
T020	I 2
T021	K 2
T022	K 2
T023	K 2
T024	L 2
T025	L 2
T026	M 2
T027	M 2
T028	B 8
T029	C10
T030	E10
T031	J16
T032	J16
T033	J16
T034	K16
T036	E21
T037	E21
T038	E21
T039	J19
T040	J19
T041	K15
T042	K20
T043	H 1
T044	J 9
T046	J10


FRONT / AF PART
SOURCE SELECTOR
LEFT
RIGHT
BUFFER AMPLIFIER
EQUALIZER
PRE - AMPLIFIER
RECORD MUTE
HEADPHONE SOCKET
VOLUME MOTOR DRIVER
VOLUME LEFT
VOLUME RIGHT
SOCKET BOARD
AUX/PHONO
from/to TUNER 1153(1117)
from/to CD-BRICK or CHANGER
RESET
ACKN
STR
DATA_1
from/to RECORDER-BOARD (1715)
R-REC
L-REC
R-PB
L-PB
+12V
from/to MIC-MIX
from/to POWER-BOARD
to POWER BOARD (1300)
from/to BUILT-IN-TURNTABLE
AUX
TAPE
CD
TUNER
GND
GND_P
REC-MUTE
GND_M
+M
+5V
VOL_UP/DOWN
REC-MUTE
MUTE
from and to CONTROL PART
VOL. DOWN
VOL. UP
+5V
+2.5V
0
DC VOLTAGES measured in tuner mode
EVM
10kHz
1kHz
3kHz
300Hz
100Hz/DBB


FRONT / component side view
1 2 3 4 5 6 7 8 9 10 11 12 13
A B C D E F G H I
1401 TUNER
TUNER 1411
IR EYE
AUX-PHONO 1404
CD 1402
AUTOPROG
MONO
STBY
TUNER
CD
TAPE
AUX
LAMP
0002 HOLDER
0003 DIFFUSOR
0004 FRAME
0005 BRACKET
VOLUME POTM
3103 303 3268.2
PROG TU
BAND
PRES DWN
PRES UP
TUN DWN
TUN UP
100Hz
300Hz
1kHz
4kHz
10kHz
MS/HS
FE/CR
DOLBY
KEY
HEAD PHONE
AUX/PHONO
SOCKET BOARD
TURNTABLE
PROG-CD
EDIT
CLEAR
PREV
SHUFFLE
REPEAT
OPEN
STOP
PLAY
SCAN
PAUSE
NEXT

0002	A	9
0003	A	9
0004	A	9
0005	D	7
1401	A	1
1402	C	1
1404	B	1
1405	C	1
1406	E	8
1407	H	9
1408	I	8
1409	I	5
1410	I	6
1411	A	4
1413	F	9
1414	F	1
1415	A	5
1416	B	6
1417	B	7
1418	F	5
1419	H	10
1421	B	13
1422	B	12
1424	I	12
1425	A	13
1426	A	12
1427	I	10
1428	I	13
1429	I	10
1430	I	11
1431	I	12
1432	I	13
1433	F	10
1434	B	11
1435	B	11
1436	B	3
1437	F	4
1438	F	2
1439	E	1
1440	F	1
1441	I	1
1442	I	3
1443	I	3
1444	F	3
1446	I	1
1447	I	2
1448	B	3
2401	A	2
2402	A	2
2403	D	3
2404	B	2
2405	D	4
2406	B	2
2407	D	2
2408	B	2
2409	C	2
2410	B	3
2411	C	3
2412	B	2
2413	C	4
2414	B	2
2415	C	3
2416	B	3
2417	C	4
2418	B	3
2419	F	2
2420	E	3
2421	E	2
2422	F	3
2423	B	2
2424	B	4
2425	F	2
2426	F	3
2427	E	2
2428	E	3
2429	E	13
2430	E	13
2431	D	12
2432	E	13
2433	D	12
2434	D	13
2435	D	12
2436	D	12
2437	D	12
2438	D	12
2439	D	11
2440	D	11
2441	D	11
2442	D	11
2443	E	10
2444	E	11
2445	D	11
2446	D	10
2447	C	4
2448	C	4
2449	C	13
2450	C	12
2451	C	11
2452	C	12
2453	D	13
2454	B	13
2455	C	11
2456	C	12
2460	D	3
2461	D	3
2462	D	4
2463	D	3
2464	E	3
2465	F	8
2466	C	13
2467	E	1
2468	C	1
2469	H	9
2470	I	9
2471	H	8
2472	I	8
2473	I	9
2475	A	2
2476	F	12
2477	I	10
2502	E	5
2503	D	5
2504	B	6
2505	A	11
2507	B	12
2508	A	3
2509	A	3
2510	A	4
2512	E	5
2513	E	5
2514	C	4
2552	I	9
2553	I	9
2554	I	5
2555	I	5
2556	D	13
2557	D	13
2558	C	12
3401	A	1
3402	A	1
3403	A	1
3404	A	1
3405	C	1
3406	C	1
3407	C	1
3408	C	1
3409	D	2
3410	D	2
3413	B	1
3414	B	1
3415	I	9
3416	I	8
3417	D	3
3418	C	3
3419	D	4
3420	C	2
3421	D	3
3422	C	3
3423	D	2
3424	C	3
3425	D	4
3426	C	4
3427	F	2
3428	E	3
3431	F	2
3432	F	3
3433	F	1
3434	F	2
3435	E	2
3436	E	3
3437	D	2
3438	D	2
3439	D	12
3440	D	12
3441	C	13
3442	C	13
3443	D	13
3444	D	13
3445	D	12
3446	D	13
3447	D	12
3448	D	12
3449	D	11
3450	D	11
3451	D	11
3452	D	11
3455	E	10
3456	E	11
3457	E	11
3458	E	11
3459	E	12
3460	E	12
3461	E	12
3462	E	13
3463	C	11
3464	D	12
3465	C	12
3466	C	12
3469	C	12
3470	B	12
3471	E	13
3472	E	13
3473	C	13
3474	D	13
3475	F	2
3476	E	3
3477	F	8
3478	F	7
3480	D	7
3481	D	13
3482	D	12
3483	D	12
3484	D	11
3485	D	11
3486	E	3
3487	E	4
3488	E	3
3489	E	2
3490	E	2
3491	F	8
3492	F	7
3493	E	7
3494	E	7
3495	E	8
3496	E	8
3497	E	6
3498	E	6
3499	B	8
3500	A	4
3501	C	9
3502	C	9
3503	A	11
3504	A	12
3505	A	12
3506	C	5
3507	B	4
3508	B	4
3516	A	3
3517	A	3
3526	D	5
3528	B	2
3530	A	3
3531	A	3
3532	A	3
3533	A	3
3534	A	3
3535	A	3
3536	A	2
3537	B	4
3538	B	4
3539	A	4
3540	E	6
3552	F	4
3554	A	13
3555	A	12
3556	A	13
3557	A	13
3558	B	11
3559	B	11
3560	B	11
3562	D	5
3563	D	5
3564	A	11
3565	A	2
3568	B	9
3572	A	11
3573	F	9
3574	F	9
3575	F	9
3576	F	11
3577	E	9
3578	F	9
3579	F	10
3580	E	10
3581	E	10
3585	B	4
3586	C	5
3587	F	5
3589	B	11
3590	D	4
3591	B	11
3592	D	4
3593	B	11
3594	B	5
3595	B	5
3596	B	5
3597	B	5
3598	A	2
3601	E	2
3602	F	3
3603	F	2
3604	F	3
3605	C	1
3606	C	1
3607	C	2
3608	C	2
3609	D	2
3610	D	10
3612	B	5
3613	C	7
3615	A	2
3616	E	7
3617	G	7
3618	F	6
3620	B	6
3621	E	1
3622	D	1
3623	E	2
3624	E	1
3649	H	9
3650	I	9
3651	H	10
3652	I	9
3653	H	8
3654	I	8
3655	I	9
3660	I	9
3661	I	9
3662	B	10
3663	C	10
3664	E	7
3665	F	7
3666	F	7
3667	C	9
3668	B	5
5401	B	7
5402	B	5
5405	E	3
6401	D	2
6402	C	3
6403	D	3
6404	C	3
6405	D	4
6406	C	2
6407	D	3
6408	C	3
6409	D	3
6410	C	3
6411	D	4
6412	C	2
6413	D	3
6414	C	3
6415	D	2
6416	C	4
6418	B	12
6419	B	12
6420	F	12
6421	F	12
6422	C	11
6423	C	11
6424	C	11
6425	C	11
6427	A	12
6428	C	9
6431	F	5
6442	D	2
6450	C	9
6453	F	7
6455	D	1
6456	E	1
7403	C	12
7406	F	6
7407	E	2
7408	F	8
7409	F	7
7410	F	7
7411	F	7
7412	F	6
7413	F	8
7418	C	4
7419	E	4
7420	B	11
7421	D	5
7422	B	1
7423	D	9
7424	D	9
7425	E	5
7426	A	11
7427	D	5
7432	D	9
7433	E	10
7440	E	9
7445	C	2
7446	B	2
7447	I	9
7448	I	9
8400	D	7

1411	A 9
1413	L12
1415	A 1
1416	M 5
1417	M 6
1418	N 2
1421	G16
1422	G17
1424	H17
1425	G18
1426	G16
1427	H16
1428	H18
1429	H16
1430	H16
1431	H17
1432	H18
1433	H16
1434	G16
1435	G17
1436	K16
1437	J16
1438	J17
1439	K18
1440	K17
1441	I18
1442	J16
1443	J16
1444	J16
1446	J18
1447	J17
1448	K16
2423	G13
2424	G13
2447	G14
2448	G14
2502	N 5
2503	N 6
2504	H12
2505	K 8
2507	I22
2508	C11
2509	D11
2510	D11
2512	K 3
2513	C18
2514	E19
3499	J 9
3500	D10
3501	L 5
3502	M 5
3503	J 6
3504	J 6
3505	K 7
3506	L11
3507	D10
3508	D11
3516	C 8
3517	C 9
3526	M 9
3528	M 8
3530	C11
3531	C11
3532	C11
3533	B11
3534	B11
3535	B11
3536	B11
3537	D10
3538	D10
3539	D 9
3540	J 3
3552	B19
3554	E15
3555	E16
3556	E17
3557	E18
3558	G22
3559	G22
3560	G22
3562	K 9
3563	J 5
3564	K 7
3565	M 8
3568	I12
3572	D11
3573	L13
3574	J14
3575	L13
3576	J14
3577	N12
3578	M13
3579	M13
3580	N14
3581	M14
3585	D14
3586	G14
3587	G15
3589	H21
3590	G21
3591	H21
3592	G21
3593	H22
3594	F12
3595	F12
3596	F12
3597	F12
3598	D14
3612	E19
3613	K 9
3620	G12
3621	K10
3622	J10
3623	K10
3624	J10
3667	L 5
3668	M 7
5401	J 8
5402	G12
6418	F20
6419	G20
6420	H20
6421	H20
6422	J20
6423	K20
6424	K21
6425	K21
6427	K 6
6428	M 4
6431	C18
6450	L 4
7415	F 8
7418	C 7
7419	C21
7420	I20
7421	M 8
7422	L 7
7423	L 5
7424	L 6
7425	M 5
7426	J 7
7427	K 3
7432	K14
7433	N13
7440	N13
8400	L 9
9402	C 4
T050	L 2
T051	L 2
T052	L 3
T053	L 2
T054	M 2
T055	M 2
T056	M 2
T057	M 2
T058	N 2
T059	M 6
T060	K 6
T061	M 8
T062	J10
T064	I12
T065	I12
T066	N15
T068	C 9
T069	C10
T070	C10
T071	C10
T072	C11
T073	C11
T078	E12
T082	F16
T083	F15
T084	J19
T085	I19
T086	H19
T087	H19
T088	F17
T089	F18
T098	J 8
T099	J 8
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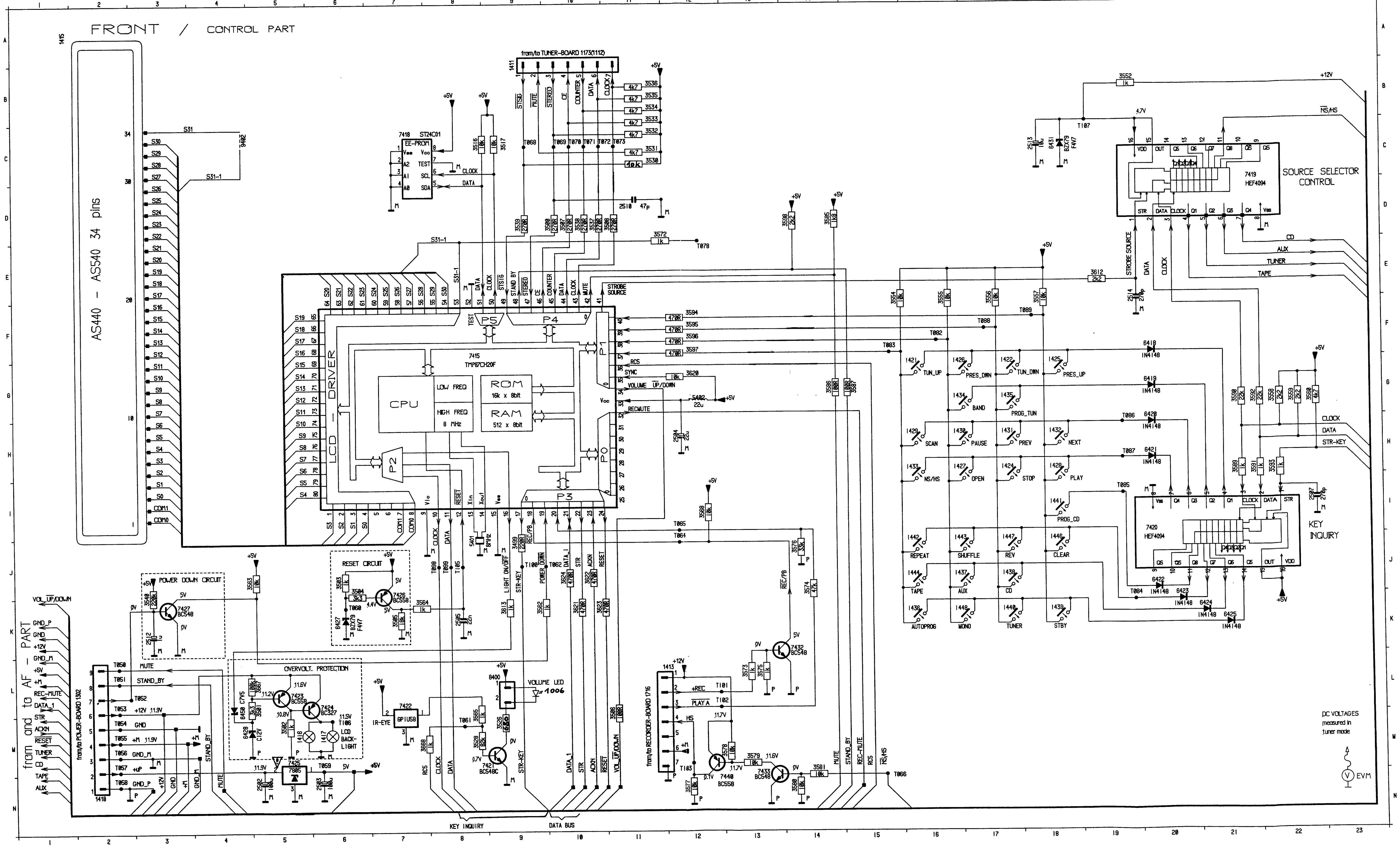
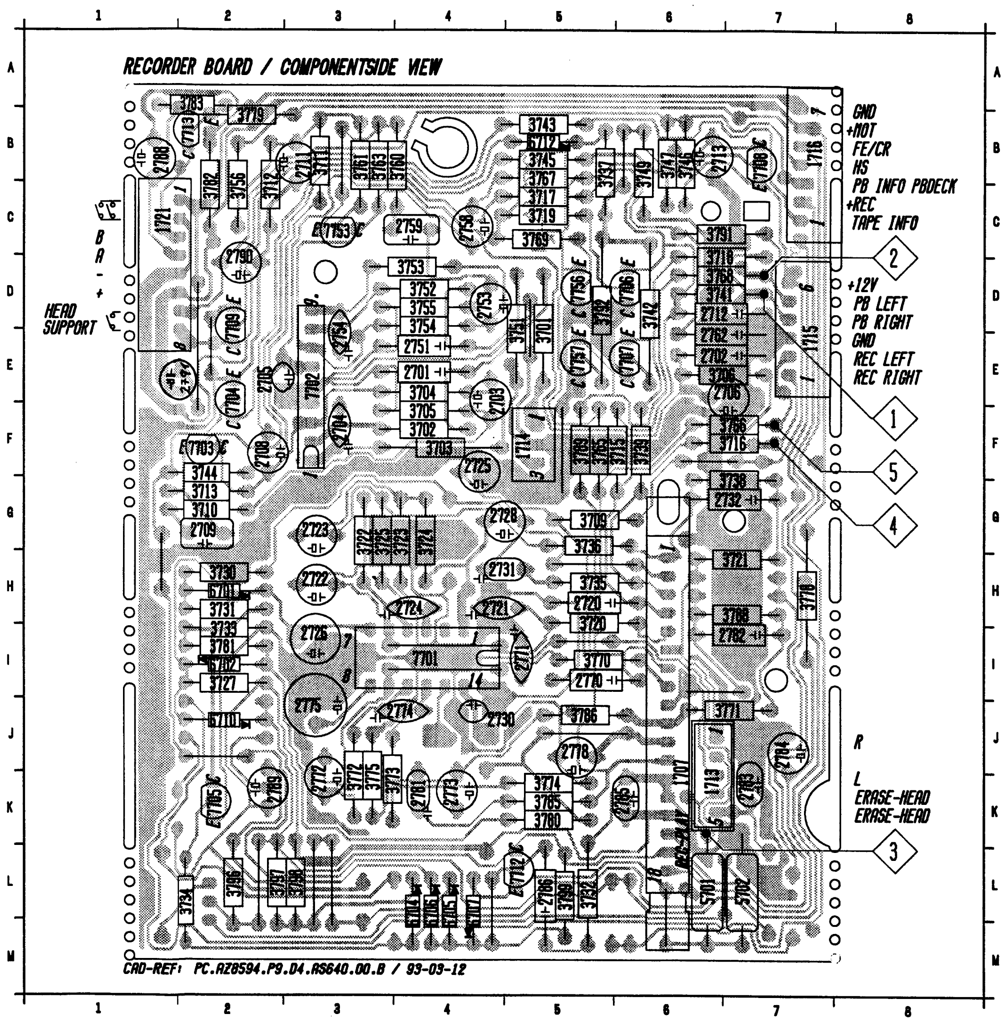
T101	L12
T102	L12
T103	M12
T104	M12
T105	J 8
T106	M 6
T107	C19


FRONT / CONTROL PART
AS440 - AS540 34 pins
from/to TUNER-BOARD 1173(1112)
7418 ST24C01 EE-PROM
7415 TMP87CH20F
CPU
LOW FREQ
HIGH FREQ 8 MHz
ROM 16k x 8bit
RAM 512 x 8bit
LCD - DRIVER
P0 P1 P2 P3 P4 P5
SOURCE SELECTOR CONTROL
7419 HEF4094
KEY INQUIRY
7420 HEF4094
CD
AUX
TUNER
TAPE
CLOCK
DATA
STR-KEY
TUN_UP
PRES_DWN
TUN_DWN
PRES_UP
BAND
PROG_TUN
SCAN
PAUSE
PREV
NEXT
NS/HS
OPEN
STOP
PLAY
PROG_CD
REPEAT
SHUFFLE
REV
CLEAR
TAPE
AUX
CD
AUTOPROG
MONO
TUNER
STBY
POWER DOWN CIRCUIT
RESET CIRCUIT
OVERVOLT. PROTECTION
LCD BACK-LIGHT
VOLUME LED
IR-EYE
from/to POWER-BOARD 1302
from/to RECORDER-BOARD 1716
from and to AF - PART
VOL_UP/DOWN
GND_P
GND
+12V
GND_M
+5V
+M
REC-MUTE
DATA_1
STR
ACKN
RESET
TUNER
CD
TAPE
AUX
MUTE
STAND_BY
+REC
PLAY A
HS
KEY INQUIRY
DATA BUS
DC VOLTAGES measured in tuner mode
EVM



1707	J6	3711	B3	3783	A2
1713	K6	3712	C2	3785	K5
1714	F5	3713	G2	3786	J5
1715	E7	3715	F6	3788	H7
1716	B7	3716	F7	3789	F5
1721	C1	3717	C5	3791	C6
2701	E4	3718	D6	3792	D5
2702	E6	3719	C5	3796	L2
2703	E4	3720	H5	3797	L2
2704	F3	3721	H7	3798	L3
2705	E2	3722	G3	3799	L5
2706	E7	3723	G4	5701	L6
2708	F2	3724	G4	5702	L7
2709	G2	3725	G3	6701	H2
2711	B3	3727	I2	6702	I2
2712	D6	3730	H2	6704	L4
2713	B6	3731	H2	6705	L4
2720	H5	3732	L5	6706	L4
2721	H4	3733	I2	6707	L4
2722	H3	3734	L2	6710	J2
2723	G3	3735	H5	6712	B5
2724	H4	3736	G5	7701	I4
2725	F4	3737	B5	7702	E3
2726	I3	3738	G7	7703	F2
2728	G5	3739	F6	7704	E2
2730	J4	3741	D6	7705	K2
2731	H5	3742	D6	7706	D6
2732	G7	3743	B5	7707	E6
2751	E4	3744	F2	7708	B7
2753	D4	3745	B5	7709	D2
2754	E3	3746	B6	7712	L5
2758	C4	3747	B6	7713	B2
2759	C4	3749	B6	7753	C3
2762	E6	3751	D5	7756	D5
2770	I5	3752	D4	7757	E5
2771	I5	3753	D4	9701	L7
2772	K3	3754	D4	9702	L6
2773	K4	3755	D4	9705	L4
2774	J4	3756	C2	9706	J2
2775	J3	3760	B4	9707	H1
2778	J5	3761	B3	9708	D5
2781	K4	3763	B3	9709	E2
2782	I7	3765	F5	9711	J5
2783	K7	3766	F7	9712	I6
2784	J7	3767	B5	9713	I5
2785	K6	3768	D6	9714	I4
2786	L5	3769	C5	9715	I4
2788	B1	3770	I5	9716	H5
2789	K2	3771	J7	9717	B3
2790	D2	3772	K3	9722	F5
3701	D5	3773	K3	9723	F6
3702	F4	3774	K5	9727	L3
3703	F4	3775	K3	9731	E2
3704	E4	3778	H7	9732	L2
3705	F4	3779	B2	9733	L3
3706	E6	3780	K5	9741	B6
3709	G5	3781	I2	2791	E1
3710	G2	3782	C2		

RECORDER ADJUSTMENT TABLE

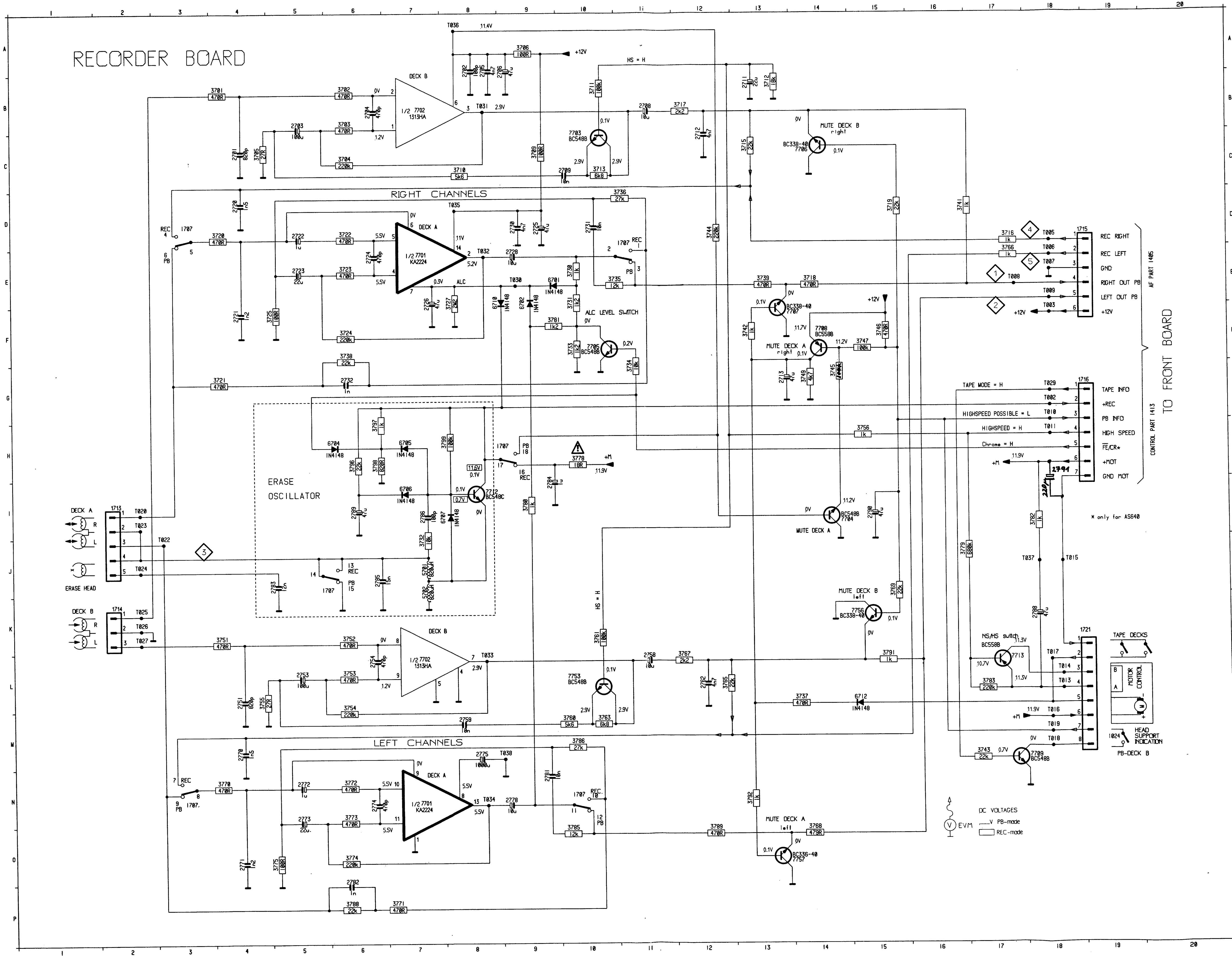
Adjustment	Cassette/Source	Recorde mode	Measure on	Read on	Adjust	
					with	to
Azimuth 1)	SBC 420 8kHz	PLAY A-Deck PLAY B-Deck	◇1 ◇2 or Phone socket	mV - meter	left-hand screw	maximum output left = right
Motor speed 2) Normal speed High speed 4)	SBC 420 3150Hz	PLAY A + B-Deck HS-Dubbing	◇1 ◇2 or Phone socket	Wow and Flutter meter or Counter Counter	pot on motor check only	0±1% 5556-5783Hz

CHECK ONLY

Check	Cassette/Source	Recorder mode	Measure on	Read on	Check if
Wow and Flutter	SBC 420 3150Hz	PLAY A or B-Deck PLAY A and B-Deck	◇1 ◇2 or Phone socket	Wow and Flutter meter	≤ 0,3% weighted ≤ 0,35% weighted
Erase Oscillator Voltage Frequency	any	REC A-deck	◇3 Erase head	mV - meter Counter	Cr ≥ 9,8Vrms Fe ≥ 20,8 Vrms f = 60kHz ± 5kHz
Playback level 3)	SBC420 315Hz 0dB level	PLAY A-Deck 5) PLAY B-Deck 5)	◇1 ◇2	mV - meter	41 mV - 57 mV 41 mV - 57 mV
Fequency reponse Playback	SBC420	PLAY A or B-Deck 5)	◇1 ◇2	mV - meter	125 Hz - 10 kHz within 8dB
Overall	Level = 0,5mV ◇4 ◇5	REC A-Deck 5) PLAY A-Deck 5)	◇1 ◇2	mV - meter	125 Hz - 10 kHz within 8dB 125 Hz - 8 kHz dubbing
Distortion	SBC 420 Level = 10mV ◇4 ◇5	REC A-Deck 5) PLAY A-Deck 5)	◇1 ◇2	mV - meter	50 mV ± 10 mV, D ≤ 5%

SBC 420 Service code: 4822 397 30071

1) For Azimuth adjustment set need not to be dismantled. Remove ornamental part of cassette door and put screwdriver (torx5) through holes of cassette door.
2) Absolute difference between deck A and deck B have to be ≤2%.
3) Noise level in "PAUSE" should be 80 - 180µV (A-weighted).
4) Insert SBC420 in A-Deck and use High speed dubbing mode to check frequency.
5) Recorder has to be in Fe- Mode

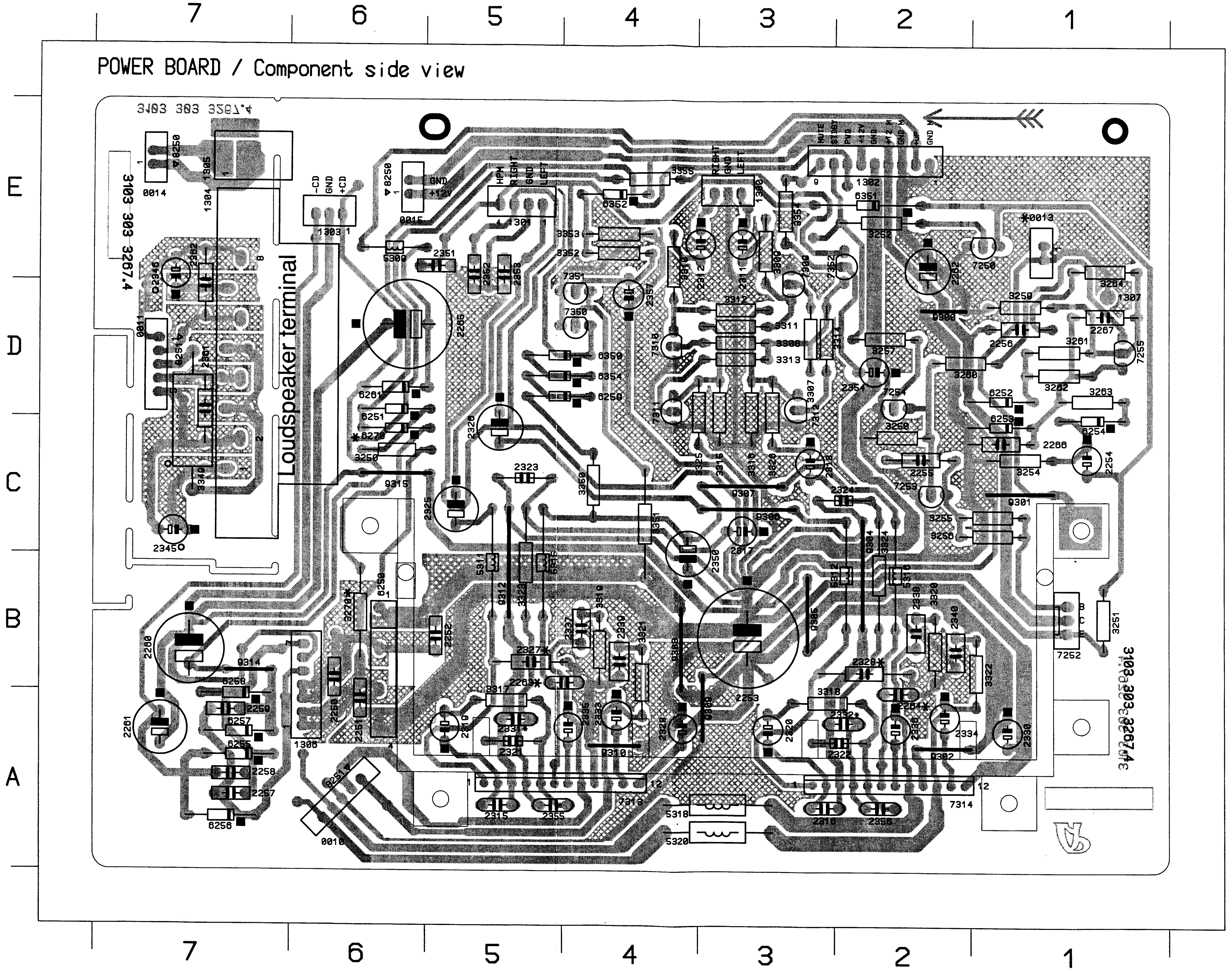

RECORDER BOARD
RIGHT CHANNELS
LEFT CHANNELS
ERASE OSCILLATOR
DECK A
DECK B
1/2 7702 1313HA
1/2 7701 KA2224
ALC LEVEL SWITCH
MUTE DECK B right
MUTE DECK A right
MUTE DECK A
MUTE DECK B left
MUTE DECK A left
ERASE HEAD
REC RIGHT
REC LEFT
GND
RIGHT OUT PB
LEFT OUT PB
+12V
AF PART 1405
TAPE INFO
+REC
PB INFO
HIGH SPEED
FE/CR*
+MOT
GND MOT
CONTROL PART 1413
TO FRONT BOARD
TAPE MODE = H
HIGHSPEED POSSIBLE = L
HIGHSPEED = H
Chrome = H
HS = H
NS/HS switch
TAPE DECKS
MOTOR CONTROL
HEAD SUPPORT INDICATION
PB-DECK B
* only for AS640
DC VOLTAGES
EVM
V PB-mode
REC-mode
1713
1714
1715
1716
1721
1707
1024

1707	D11
1707	N10
1707	N 3
1707	J 6
1707	H 9
1707	D 3
1713	I 2
1714	K 2
1715	D18
1716	G18
1721	K18
2701	C 4
2702	A 8
2703	B 5
2704	B 6
2705	A 8
2706	A 9
2708	B11
2709	C10
2711	B13
2712	C12
2713	G13
2720	D 4
2721	F 4
2722	D 5
2723	E 5
2724	E 6
2725	D 9
2726	E 7
2728	E 9
2730	D 9
2731	D10
2732	G 6
2751	L 4
2753	L 5
2754	L 6
2758	L11
2759	M 8
2762	L12
2770	M 4
2771	O 4
2772	N 5
2773	N 5
2774	N 6
2775	M 8
2778	N 9
2781	N 9
2782	O 6
2783	J 5
2784	I 9
2785	J 6
2786	I 7
2788	K18
2789	I 6
2790	I15
3701	B 4
3702	B 6
3703	B 6
3704	C 6
3705	C 4
3706	A 9
3709	C 9
3710	C 8
3711	B10
3712	B13
3713	C10
3715	C13
3716	D17
3717	B12
3718	E14
3719	D15
3720	D 4
3721	G 4
3722	D 6
3723	E 6
3724	F 6
3725	F 5
3727	E 8
3730	E10
3731	E10
3732	J 7
3733	F10
3734	G11
3735	E11
3736	D11
3737	L14
3738	F 6
3739	E12
3739	E13
3741	D16
3742	F13
3743	M17
3744	D12
3745	G14
3746	F15
3747	F15
3749	G14
3751	K 4
3752	K 6
3753	L 6
3754	L 6
3755	L 4
3756	H15
3760	M10
3761	K10
3763	M10
3765	L12
3766	E17
3767	L12
3768	O14
3769	J15
3770	N 4
3771	P 7
3772	N 6
3773	N 6
3774	O 6
3775	O 5
3778	H10
3779	J16
3780	I 9
3781	F 9
3782	I18
3783	L17
3785	O10
3786	M10
3788	P 6
3789	O12
3791	L15
3792	N13
3796	H 6
3797	H 6
3798	H 6
3799	H 8
5701	J 7
5702	J 7
6701	E 9
6702	E 9
6704	H 6
6705	H 7
6706	I 7
6707	I 7
6710	E 8
6712	L15
7701	E 7
7701	N 7
7702	B 7
7702	L 7
7703	B10
7704	I14
7705	F10
7706	C14
7707	F13
7708	F14
7709	M18
7712	I 8
7713	L17
7753	L10
7756	K15
7757	O13
T002	G18
T003	F18
T005	D18
T006	E18
T007	E18
T008	E17
T009	E18
T010	G18
T011	H18
T013	L18
T014	L18
T015	J18
T016	M18
T017	L18
T018	M18
T019	M18
T020	I 2
T022	I 3
T023	I 2
T024	J 2
T025	K 2
T026	K 2
T027	K 2
T029	G18
T030	E 9
T031	B 8
T032	E 8
T033	L 8
T034	N 8
T035	D 8
T036	A 8
T037	J18
T038	M 9

E B C FOR ALL TRANSISTORS

* NOT USED COMPONENTS

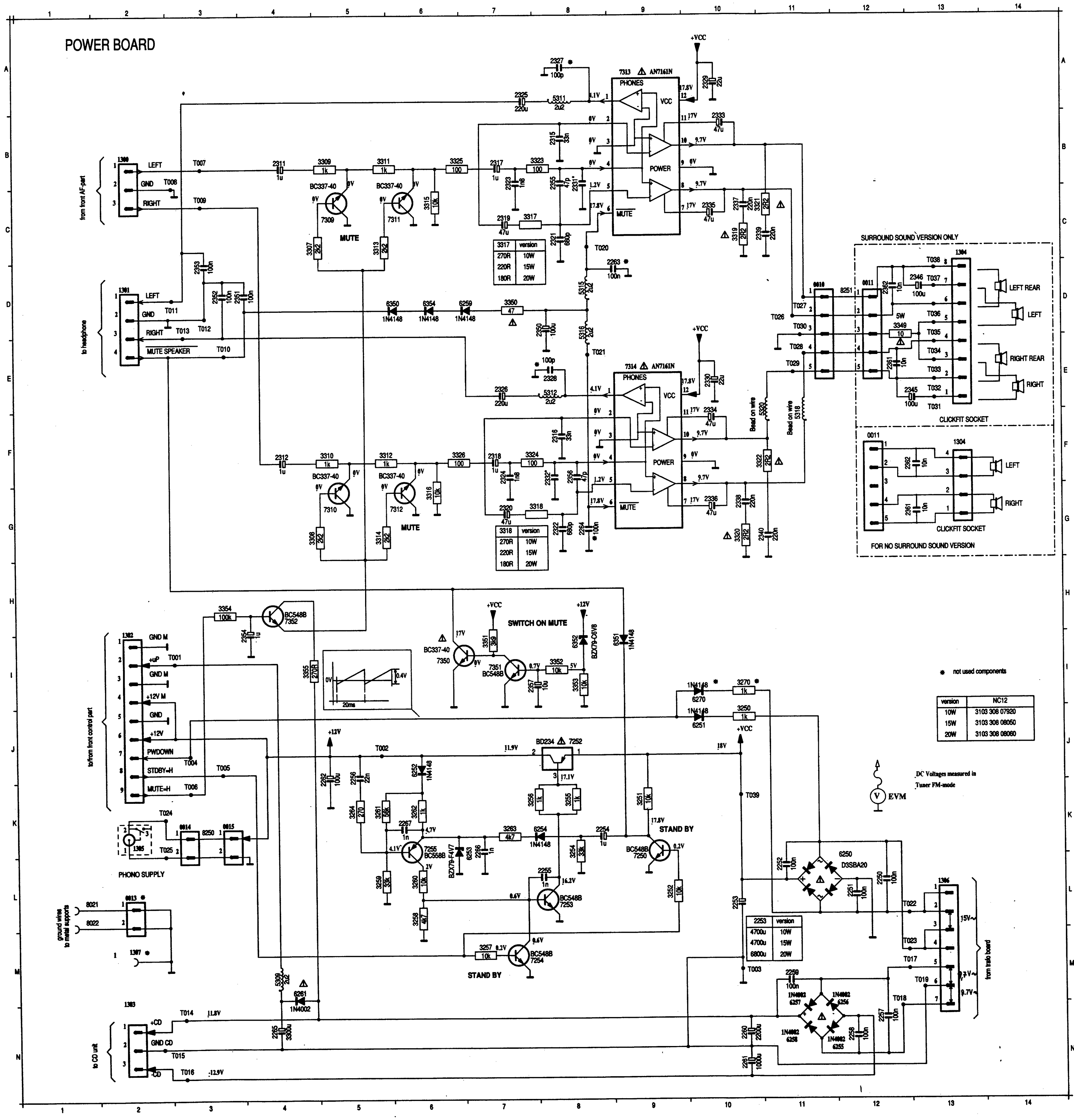
o FOR SURROUND ONLY



POWER BOARD / Component side view

7
6
5
4
3
2
1
E
D
C
B
A
Loudspeaker terminal
3103 303 3267.4
-CD
GND
+CD
GND
+12V
HPN
RIGHT
GND
LEFT
MUTE
STBY
PWR
+12V
GND
GND M
0014
0015
0011
0010
1303
1301
1300
1302
1304
1305
1306
7252
7314
7313
5318
5320
B
C
E

	9304 B 2	7310 D 4	6270 C 6	6250 B 6	3352 E 4	3319 B 4	3308 D 3	3256 C 1	2354 D 2	2336 A 2	2325 C 5	2312 E 3	2258 A 7	1305 E 7
	9302 A 2	7309 D 3	6261 D 6	5320 A 3	3351 C 4	3318 A 3	3307 D 3	3255 C 1	2353 E 5	2335 A 4	2324 C 2	2311 E 3	2257 A 7	1304 D 7
9315 C 6	9301 C 1	7255 D 1	6259 D 5	5318 A 3	3350 C 4	3317 A 5	3270 B 6	3254 C 1	2352 E 5	2334 A 2	2323 C 5	2267 D 1	2256 D 1	1303 E 6
9314 B 7	9300 D 2	7254 D 2	6258 A 7	5316 B 2	3349 C 7	3316 D 3	3264 E 1	3252 E 2	2351 E 5	2333 A 4	2322 A 2	2266 C 1	2255 C 2	1302 E 2
9312 B 5	7352 E 2	7253 C 2	6257 A 7	5315 B 5	3326 D 3	3315 D 3	3263 D 1	3251 B 1	2350 C 4	2332* A 2	2321 A 5	2265 D 6	2254 C 1	1301 E 5
9310 A 4	7351 D 4	7252 B 1	6256 A 7	5312 B 2	3325 D 3	3314 D 3	3262 D 1	3250 C 6	2346 E 7	2331* A 5	2320 A 3	2264 A 2	2253 B 3	1300 E 3
9309 A 3	7350 D 4	7250 E 1	6255 A 7	5311 B 5	3324 B 2	3313 D 3	3261 D 1	2362 D 7	2345 C 7	2330 A 1	2319 A 5	2263 B 4	2252 B 5	0015 E 6
9308 B 4	7314 A 2	6354 D 5	6254 D 1	5309 E 6	3323 B 5	3312 D 3	3260 D 2	2361 D 7	2340 B 2	2329 A 4	2318 C 3	2262 E 2	2251 A 6	0014 E 7
9307 C 3	7313 A 5	6352 E 4	6253 C 1	3355 E 4	3322 B 1	3311 D 3	3259 D 1	2357 D 4	2339 B 4	2328 B 2	2317 C 3	2261 A 7	2250 B 6	0013 E 1
9306 C 3	7312 D 3	6351 E 2	6252 D 1	3354 E 3	3321 B 4	3310 E 4	3258 C 2	2356 A 2	2338 B 2	2327 B 5	2316 A 3	2260 B 7	1307 E 1	0011 D 7
9305 B 3	7311 D 4	6350 D 5	6251 D 6	3353 E 4	3320 B 2	3309 E 3	3257 D 2	2355 A 5	2337 B 4	2326 C 5	2315 A 5	2259 A 7	1306 B 6	0010 A 6


POWER BOARD
1300
LEFT
GND
RIGHT
from front AF-part
1301
MUTE SPEAKER
to headphone
7313 AN7161N
7314 AN7161N
PHONES
VCC
POWER
MUTE
BC337-40
SURROUND SOUND VERSION ONLY
LEFT REAR
LEFT
RIGHT REAR
RIGHT
CLICKFIT SOCKET
FOR NO SURROUND SOUND VERSION
Bead on wire
3317 version
270R 10W
220R 15W
180R 20W
3318 version
270R 10W
220R 15W
180R 20W
SWITCH ON MUTE
BC548B
BZX79-C6V8
1N4148
not used components
version NC12
10W 3103 308 07920
15W 3103 308 08050
20W 3103 308 08060
DC Voltages measured in Tuner FM-mode
EVM
1302
to/from front control part
PWDOWN
STDBY=H
MUTE=H
PHONO SUPPLY
BD234 7252
STAND BY
BC558B
D3SBA20
2253 version
4700u 10W
4700u 15W
6800u 20W
1306
from trafo board
1N4002
ground wires to metal supports
1303
to CD unit
+CD
GND CD
-CD

0010	D11
0011	D12
0013	L2
0014	K3
0015	K3
1300	B2
1301	D2
1302	I2
1303	M2
1304	C13
1305	K2
1306	L13
1307	M2
2250	L12
2251	L12
2252	L11
2253	L10
2254	K8
2255	L8
2256	J5
2257	N12
2258	N12
2259	M11
2260	N10
2261	N10
2262	J5
2263	D9
2264	G8
2265	N4
2266	K7
2267	K6
2311	B4
2312	F4
2315	B8
2316	F8
2317	B7
2318	F7
2319	C7
2320	G7
2321	C8
2322	G8
2323	B7
2324	F7
2325	A7
2326	E7
2327	A8
2328	E8
2329	A10
2330	E10
2331*	B8
2332*	F8
2333	B10
2334	F10
2335	C10
2336	G10
2337	C10
2338	G10
2339	C11
2340	G11
2345	E13
2346	D13
2350	D8
2351	D4
2352	D3
2353	D3
2354	H4
2355	B8
2356	F8
2357	I7
2361	E12
2362	D12
3250	J10
3251	K9
3252	L9
3254	K8
3255	K8
3256	K7
3257	M7
3258	L6
3259	L5
3260	L6
3261	K5
3262	K6
3263	K7
3264	K5
3270	I10
3307	C4
3308	G4
3309	B5
3310	F5
3311	B5
3312	F5
3313	C5
3314	G5
3315	C6
3316	G6
3317	C7
3318	G8
3319	C10
3320	G10
3321	C11
3322	F11
3323	B8
3324	F7
3325	B6
3326	F6
3349	D12
3350	D7
3351	I7
3352	I8
3353	I8
3354	H3
3355	I4
5309	M4
5311	A8
5312	E8
5315	D8
5316	D8
5318	E11
5320	E11
6250	L12
6251	J10
6252	J6
6253	K7
6254	K8
6255	N12
6256	N12
6257	N11
6258	N11
6259	D7
6261	M4
6270	I10
6350	D6
6351	I9
6352	I8
6354	D6
7250	K9
7252	J8
7253	L8
7254	M7
7255	K6
7309	C5
7310	G5
7311	C6
7312	G6
7313	A9
7314	E9
7350	I6
7351	I7
7352	H4
T001	I3
T002	J5
T003	M10
T004	J3
T005	J3
T006	K3
T007	B3
T008	B3
T009	C3
T010	E3
T011	D3
T012	D3
T013	D3
T014	N3
T015	N3
T016	N3
T017	M12
T018	M12
T019	M13
T020	C8
T021	E8
T022	L12
T023	M12
T024	K2
T025	K2
T026	D11
T027	D11
T028	E11
T029	E11
T030	D11
T031	E13
T032	E13
T033	E13
T034	E13
T035	D13
T036	D13
T037	D13
T038	C13
T039	K10

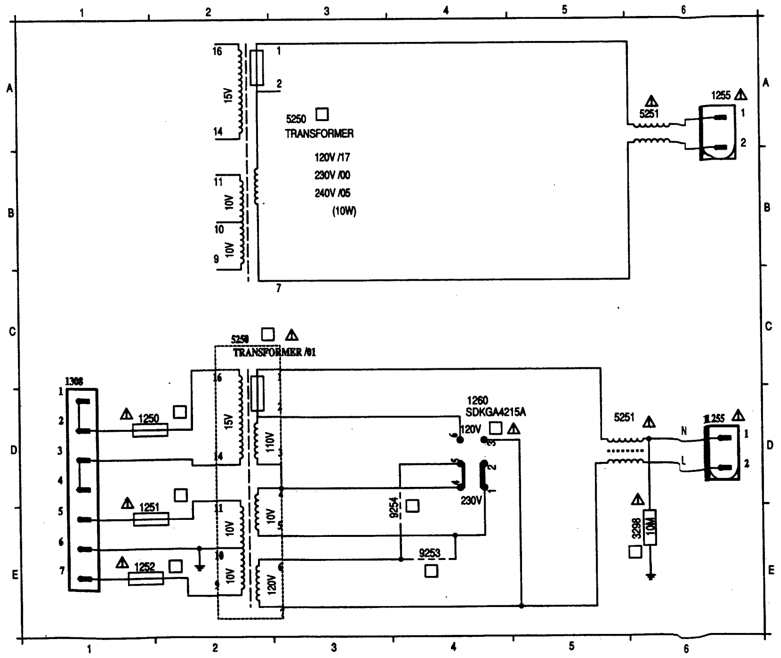
TRANSFORMER BOARD

□ COMPONENTS DEPENDING ON THE VERSION

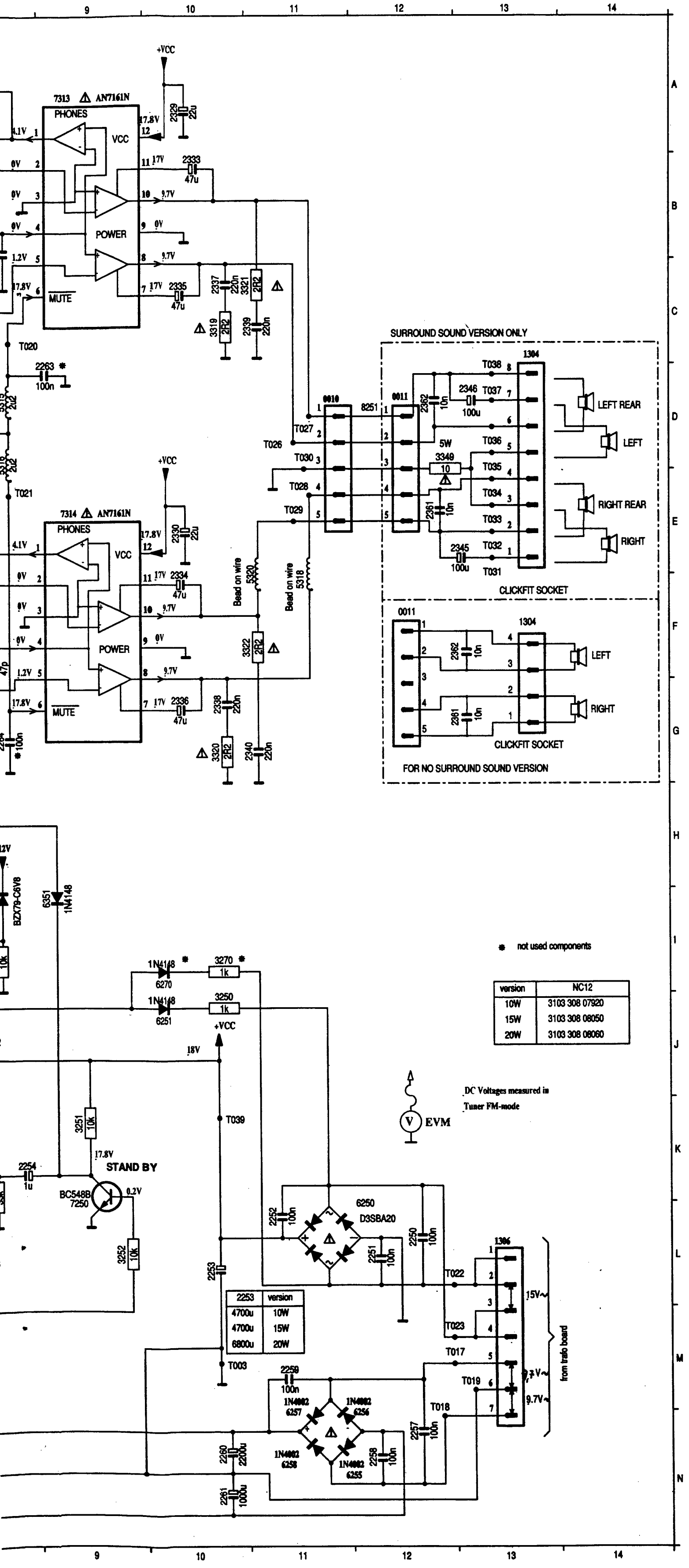
VERSION \ COMPONENTS □	1260	9253	9254	5250	3298	VALUE OF FUSE 1250 (1254)	1251 (1253)	1252 (1258)
/00 (IEC 230V)				/00		5A	630mA	630mA
/05[1] (240V)		X		/01		5A	630mA	630mA
/17 (UL 120V)				/17	X	6,3A	1,25A	1,25A
/01 /10 (120V,230V)	X		X	/01		5A	630mA	630mA
/05[1] (240V)				/05		5A	630mA	630mA

1) for 15W and 20W versions /01 transformer
for 10W version /05 transformer

1250 D1	1252 E1	1260 D4	3298 E6	5251 D5	9254 D4
1251 E1	1255 D6	1308 C1	5250 C2	9253 E4	


5250 □
TRANSFORMER
120V /17
230V /00
240V /05
(10W)
5251
1255
5250 □ TRANSFORMER /01
1308
1250
1251
1252
15V
110V
10V
1260
SDKGA4215A
120V
230V
9254
9253
3298

TRANSFORMER BOARD


+VCC
7313 ⚠ AN7161N
PHONES
VCC
POWER
MUTE
7314 ⚠ AN7161N
T020
T021
SURROUND SOUND VERSION ONLY
LEFT REAR
LEFT
RIGHT REAR
RIGHT
CLICKFIT SOCKET
FOR NO SURROUND SOUND VERSION
Bead on wire 5320
Bead on wire 5318
STAND BY
BC548B 7250
D3SBA20
6250
1306
from trafo board
15V~
9.7V~
T039
T003
T022
T023
T017
T018
T019
EVM

● not used components

version	NC12
10W	3103 308 07920
15W	3103 308 08050
20W	3103 308 08060

DC Voltages measured in Tuner FM-mode

2253	version
4700u	10W
4700u	15W
6800u	20W

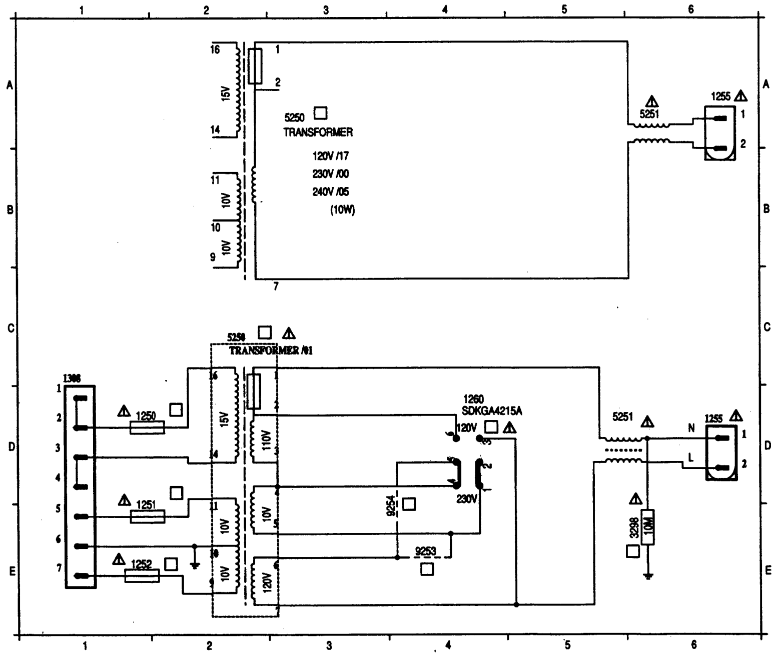
0010	D11
0011	D12
0013	L2
0014	K3
0015	K3
1300	B2
1301	D2
1302	I2
1303	M2
1304	C13
1305	K2
1306	L13
1307	M2
2250	L12
2251	L12
2252	L11
2253	L10
2254	K8
2255	L8
2256	J5
2257	N12
2258	N12
2259	M11
2260	N10
2261	N10
2262	J5
2263	D9
2264	G8
2265	N4
2266	K7
2267	K6
2311	B4
2312	F4
2315	B8
2316	F8
2317	B7
2318	F7
2319	C7
2320	G7
2321	C8
2322	G8
2323	B7
2324	F7
2325	A7
2326	E7
2327	A8
2328	E8
2329	A10
2330	E10
2331*	B8
2332*	F8
2333	B10
2334	F10
2335	C10
2336	G10
2337	C10
2338	G10
2339	C11
2340	G11
2345	E13
2346	D13
2350	D8
2351	D4
2352	D3
2353	D3
2354	H4
2355	B8
2356	F8
2357	I7
2361	E12
2362	D12
3250	J10
3251	K9
3252	L9
3254	K8
3255	K8
3256	K7
3257	M7
3258	L6
3259	L5
3260	L6
3261	K5
3262	K6
3263	K7
3264	K5
3270	I10
3307	C4
3308	G4
3309	B5
3310	F5
3311	B5
3312	F5
3313	C5
3314	G5
3315	C6
3316	G6
3317	C7
3318	G8
3319	C10
3320	G10
3321	C11
3322	F11
3323	B8
3324	F7
3325	B6
3326	F6
3349	D12
3350	D7
3351	I7
3352	I8
3353	I8
3354	H3
3355	I4
5309	M4
5311	A8
5312	E8
5315	D8
5316	D8
5318	E11
5320	E11
6250	L12
6251	J10
6252	J6
6253	K7
6254	K8
6255	N12
6256	N12
6257	N11
6258	N11
6259	D7
6261	M4
6270	I10
6350	D6
6351	I9
6352	I8
6354	D6
7250	K9
7252	J8
7253	L8
7254	M7
7255	K6
7309	C5
7310	G5
7311	C6
7312	G6
7313	A9
7314	E9
7350	I6
7351	I7
7352	H4
T001	I3
T002	J5
T003	M10
T004	J3
T005	J3
T006	K3
T007	B3
T008	B3
T009	C3
T010	E3
T011	D3
T012	D3
T013	D3
T014	N3
T015	N3
T016	N3
T017	M12
T018	M12
T019	M13
T020	C8
T021	E8
T022	L12
T023	M12
T024	K2
T025	K2
T026	D11
T027	D11
T028	E11
T029	E11
T030	D11
T031	E13
T032	E13
T033	E13
T034	E13
T035	D13
T036	D13
T037	D13
T038	C13
T039	K10

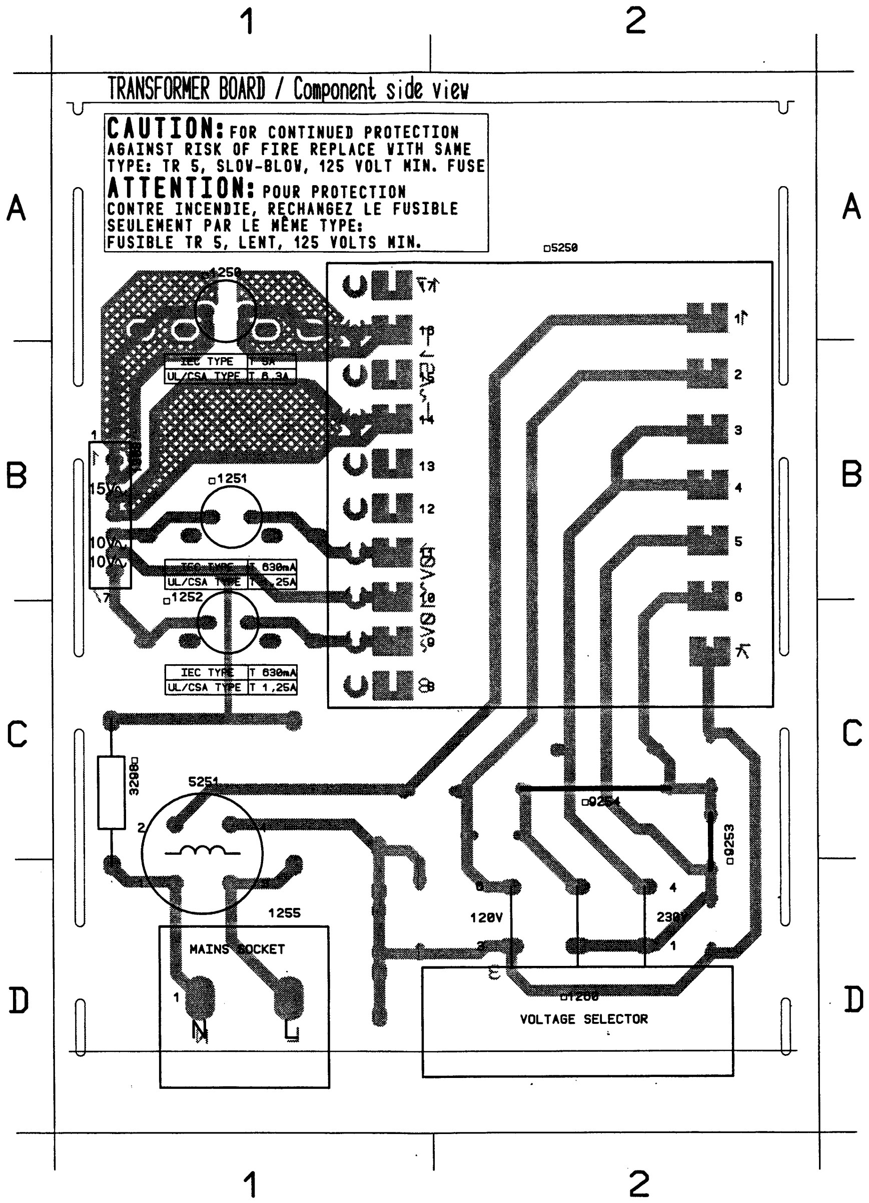
□ COMPONENTS DEPENDING ON THE VERSION

VERSION \ COMPONENTS □	1260	9253	9254	5250	3298	VALUE OF FUSE 1250 (1254)	1251 (1253)	1252 (1256)
/00 (IEC 230V)				/00		5A	630mA	630mA
/05[1)] (240V)		X		/01		5A	630mA	630mA
/17 (UL 120V)				/17	X	6,3A	1,25A	1,25A
/01 /10 (120V,230V)	X		X	/01		5A	630mA	630mA
/05[1)] (240V)				/05		5A	630mA	630mA

1) for 15W and 20W versions /01 transformer
for 10W version /05 transformer

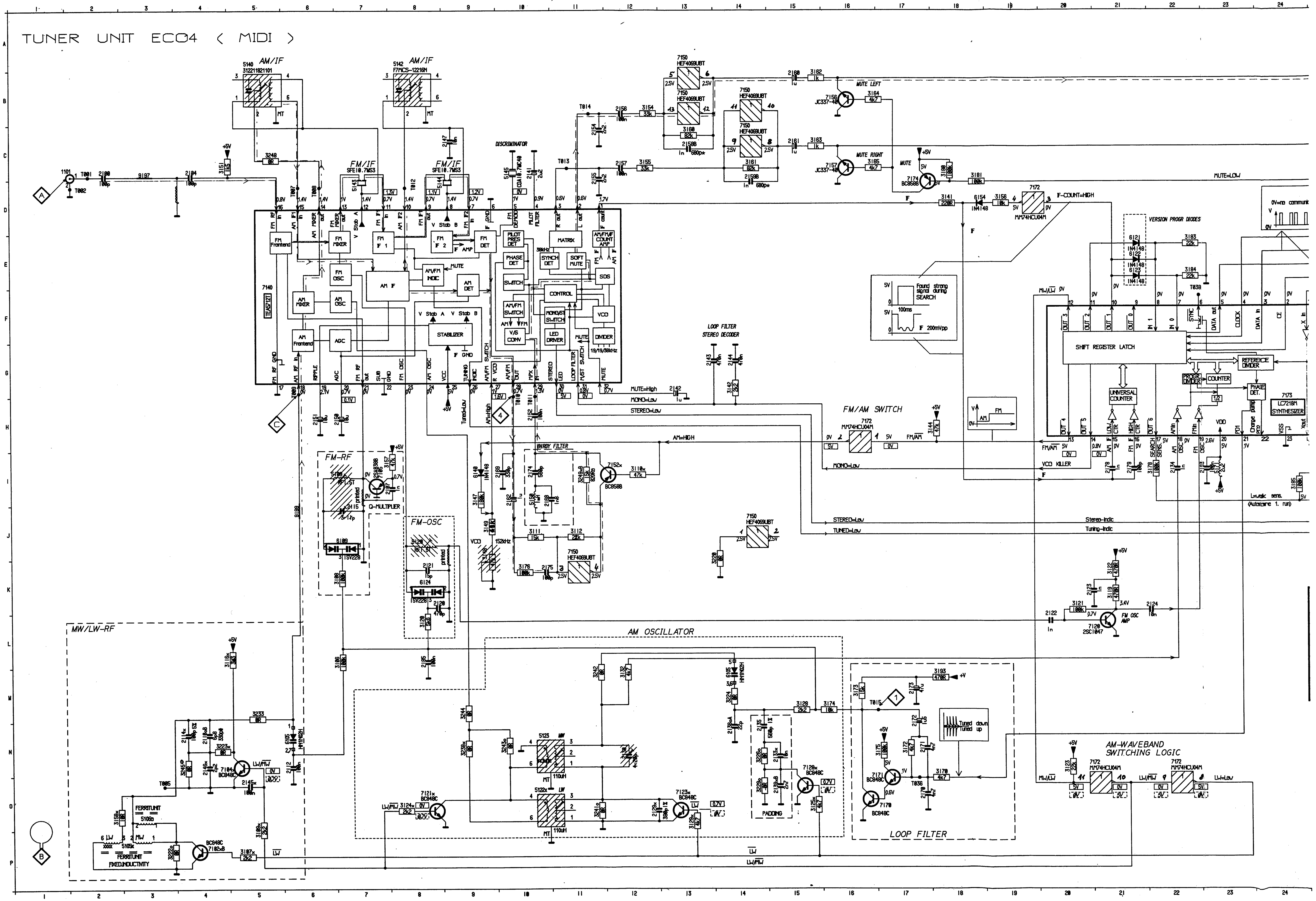
1250	D1	1252	E1	1260	D4	3298	E6	5251	D5	9254	D4
1251	E1	1255	D6	1308	C1	5250	C2	9253	E4		

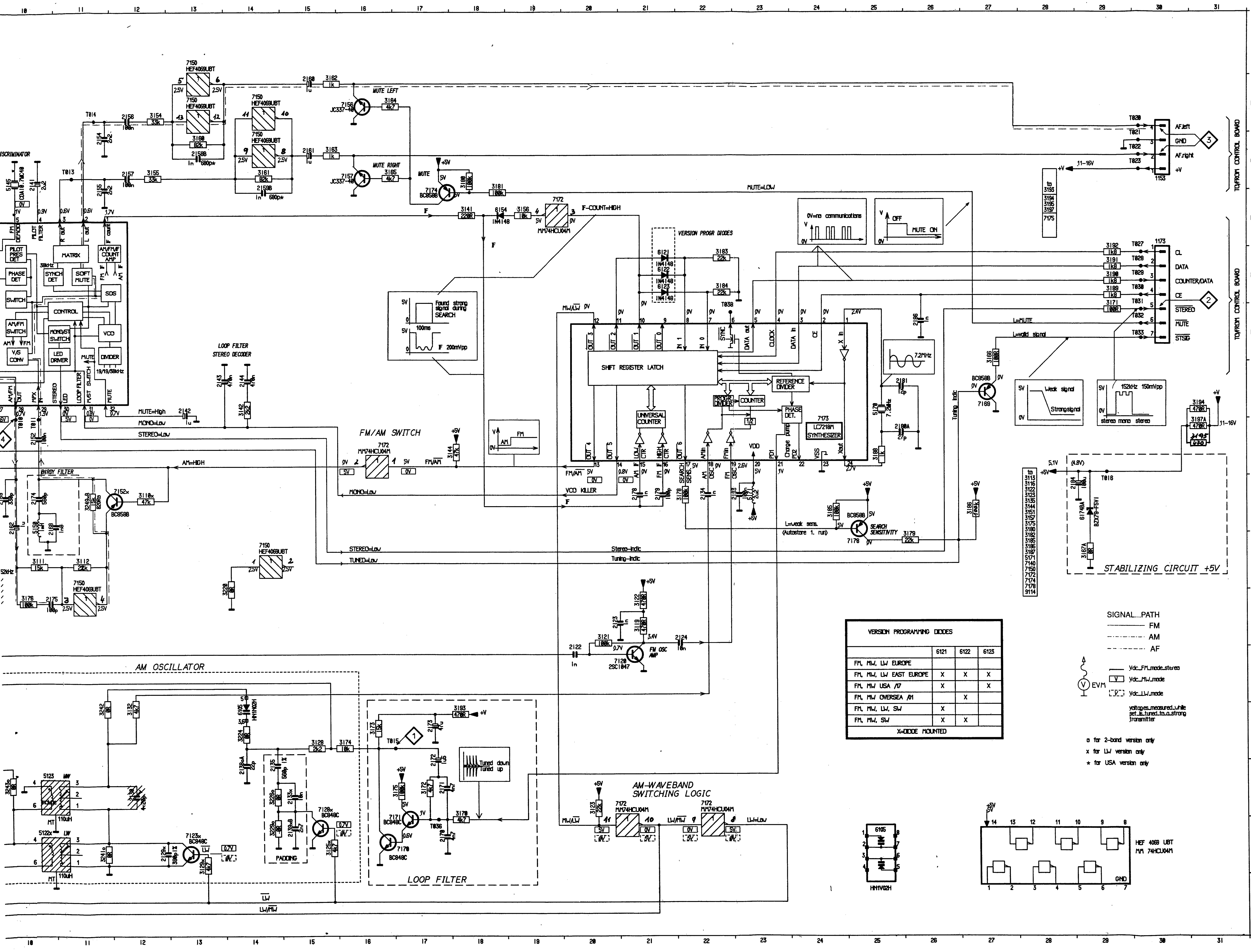

5250 □
TRANSFORMER
120V /17
230V /00
240V /05
(10W)
15V
10V
10V
5250 □ ⚠
TRANSFORMER /01
1308
⚠ 1250
⚠ 1251
⚠ 1252
1260
SDKGA4215A
120V
230V
110V
9254 □
9253 □
5251 ⚠
1255 ⚠
N
L
3298 10M


TRANSFORMER BOARD / Component side view
CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE REPLACE WITH SAME TYPE: TR 5, SLOV-BLOW, 125 VOLT MIN. FUSE
ATTENTION: POUR PROTECTION CONTRE INCENDIE, RECHANGEZ LE FUSIBLE SEULEMENT PAR LE MÊME TYPE: FUSIBLE TR 5, LENT, 125 VOLTS MIN.
IEC TYPE T 5A
UL/CSA TYPE T 6,3A
IEC TYPE T 630mA
UL/CSA TYPE T 1,25A
1250
1251
1252
5250
5251
3298
9253
9254
1255
MAINS SOCKET
N
L
120V
230V
1260
VOLTAGE SELECTOR
15V
10V
1
2
A
B
C
D

1250	B	1
1251	B	1
1252	C	1
1253	B	1
1254	B	1
1255	D	1
1256	C	1
1257	D	1
1258	D	1
1260	D	2
1308	B	1
3298	C	1
3299	C	1
5250	B	2
5251	C	1
9250	C	2
9251	D	2
9252	C	2
9253	C	2
9254	C	2
9255	C	2
9256	C	2
9257	D	1

TUNER UNIT EC04 < MIDI >


AM/IF
5140
AM/IF
5142
FM/IF
SFE10.7MS3
DISCRIMINATOR
CDA10.7MC40
7140
TEA5712T
FM Frontend
FM MIXER
FM IF 1
FM IF 2
FM DET
FM OSC
AM IF
AM/FM INDIC
AM DET
AM MIXER
AM OSC
AM Frontend
AGC
STABILIZER
PILOT PRES DET
PHASE DET
SWITCH
AM/FM SWITCH
V/S CONV
SYNCH DET
SOFT MUTE
MATRIX
AM/FM/IF COUNT AMP
SDS
CONTROL
MONO/ST SWITCH
LED DRIVER
VCO
DIVIDER
19/19/38kHz
LOOP FILTER
STEREO DECODER
7150
HEF4069UBT
MUTE LEFT
MUTE RIGHT
MUTE
MUTE=LOW
F-COUNT=HIGH
7172
MM74HCU04M
VERSION PROGR DIODES
Found strong signal during SEARCH
100ms
F 200mVpp
SHIFT REGISTER LATCH
UNIVERSAL COUNTER
PROGR DIVIDER
COUNTER
REFERENCE DIVIDER
PHASE DET.
7173
LC7218M
SYNTHESIZER
FM/AM SWITCH
MUTE=High
MONO=Low
STEREO=Low
TUNED=Low
AM=HIGH
FM/AM
VCO KILLER
Stereo-Indic
Tuning-Indic
L=walk sens. (Autostore 1. run)
FM-RF
Q-MULTIPLIER
FM-OSC
printed
BIRDY FILTER
VCO
152kHz
FM OSC AMP
7120
2SC1047
MW/LW-RF
FERRITUNIT
FERRITUNIT FIXEDINDUCTIVITY
AM OSCILLATOR
PADDING
LOOP FILTER
Tuned down
Tuned up
AM-WAVEBAND SWITCHING LOGIC
LW/MW
LW=Low
MW/LW

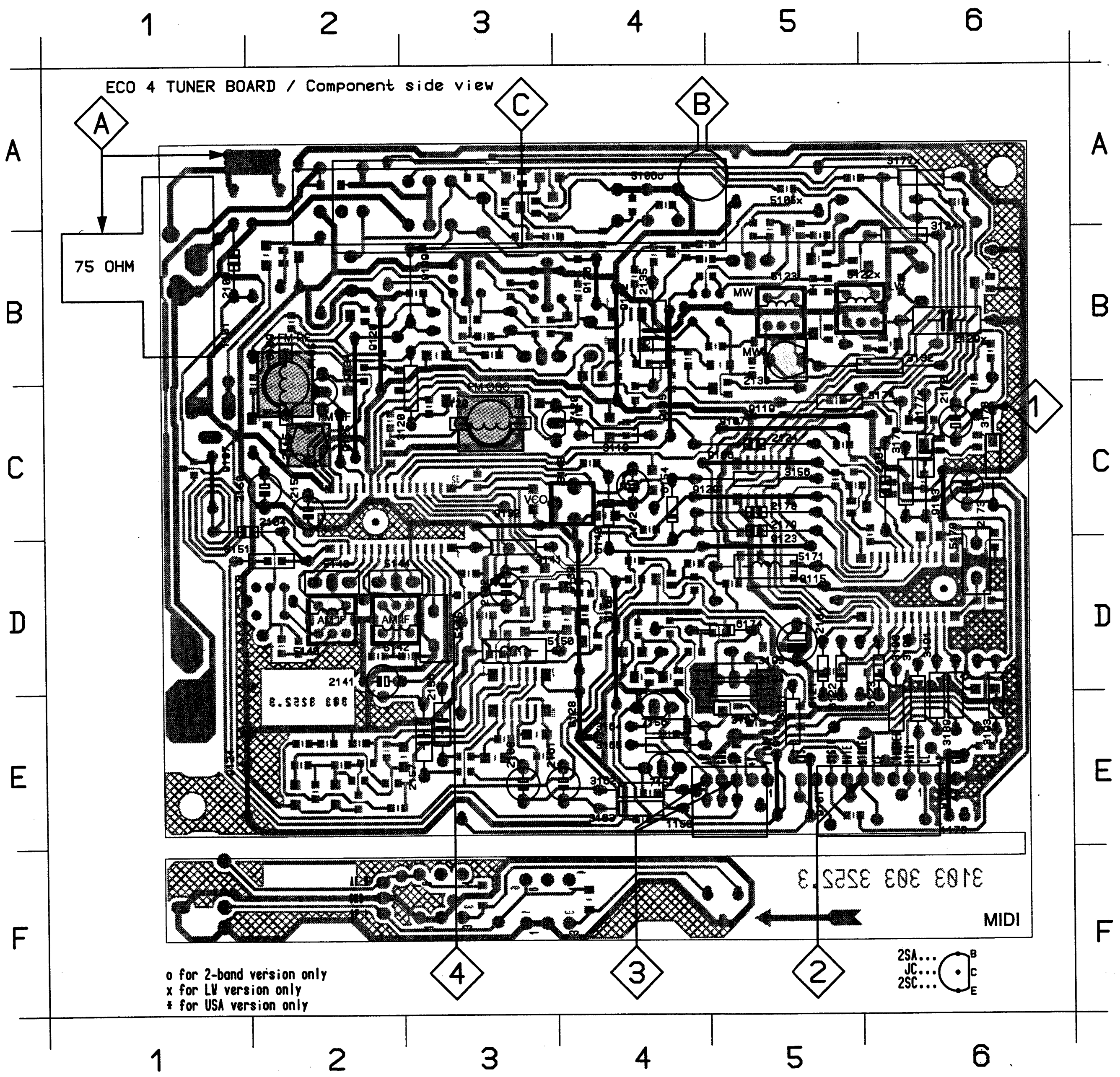

7150 HEF4069UBT
MUTE LEFT
MUTE RIGHT
MUTE
JC337-40
BC858B
MUTE=LOW
F-COUNT=HIGH
7172 MM74HCU04M
VERSION PROGR DIODES
6121 1N4148
6122 1N4148
6123 1N4148
0V=no communications
OFF
MUTE ON
AF left
GND
AF right
+V
1153
TO/FROM CONTROL BOARD
1173
CL
DATA
COUNTER/DATA
CE
STEREO
MUTE
STSIG
L=MUTE
L=valid signal
11-16V
PILOT PRES DET
PHASE DET
SWITCH
AM/FM SWITCH
V/S CONV
MATRIX
SYNCH DET
SOFT MUTE
SDS
CONTROL
MONO/ST SWITCH
VCO
LED DRIVER
DIVIDER
19/19/38kHz
AM/FM/F COUNT AMP
Found strong signal during SEARCH
100ms
F 200mVpp
LOOP FILTER STEREO DECODER
MUTE=High
MONO=Low
STEREO=Low
FM/AM SWITCH
AM=HIGH
MONO=Low
STEREO=Low
TUNED=Low
BIRDY FILTER
7152x BC858B
SHIFT REGISTER LATCH
UNIVERSAL COUNTER
PROGR DIVIDER
COUNTER
REFERENCE DIVIDER
PHASE DET.
7173 LC7218M SYNTHESIZER
OUT 3
OUT 2
OUT 1
OUT 0
IN 1
IN 0
SYNC
DATA out
CLOCK
DATA in
CE
X in
OUT 4
OUT 5
LOW CTR
HIGH CTR
OUT 6
SEARCH SENS
AMin
FMin
VDD
PD1
Charge pump PD2
VSS
Xout
MW/LW
FM/AM
VCO KILLER
7.2MHz
L=weak sens. (Autostore 1. run)
SEARCH SENSITIVITY
7178 BC858B
Stereo-indic
Tuning-indic
Weak signal
Strong signal
152kHz 150mVpp
stereo mono stereo
7169 BC858B
STABILIZING CIRCUIT +5V
BZX79-F5V1
FM OSC AMP
7120 2SC1047
AM OSCILLATOR
5123 MW
5122x LW
110uH
7123x BC848C
PADDING
7128x BC849C
LOOP FILTER
7171 BC849C
7170 BC848C
Tuned down
Tuned up
AM-WAVEBAND SWITCHING LOGIC
LW/MW
LW=Low
SIGNAL...PATH
FM
AM
AF
EVM
Vdc_FM_mode_stereo
Vdc_MW_mode
Vdc_LW_mode
voltages measured while set is tuned to a strong transmitter
o for 2-band version only
x for LW version only
* for USA version only
HN1V02H
HEF 4069 UBT
MM 74HCU04M
GND

VERSION PROGRAMMING DIODES	6121	6122	6123
FM, MW, LW EUROPE			
FM, MW, LW EAST EUROPE	X	X	X
FM, MW USA /17	X		X
FM, MW OVERSEA /01		X	
FM, MW, LW, SW	X		
FM, MW, SW	X	X	
X=DIODE MOUNTED			

1101	C 2
1153	C30
1173	D30
2100	C 2
2104	C 4
2107	I 8
2110o	N 4
2112	N 6
2114x	N 4
2115	J 7
2120	K 8
2121	K 8
2122	K20
2123	K20
2124	K22
2129x	O12
2130	N12
2133x	N15
2134	I22
2135	N14
2138o	N14
2139x	O15
2141	C10
2142	G13
2143	G13
2144	G14
2145x	O 5
2146x	N 4
2147	C 9
2150	H 7
2151	H 6
2152	H10
2154	C11
2155	C11
2156	B12
2157	C12
2158B	C13
2159B	C14
2160	B15
2161	C15
2162	I10
2168	I10
2169	I10
2170	O17
2171	N17
2172	M17
2173	M17
2174	I10
2175	K10
2177x	O18
2178	I21
2179	I21
2180A	H25
2181	G25
2183	I23
2184	I29
2185	L 8
2186	F26
3106	L 7
3107x	P 5
3108	K 7
3109x	O 5
3110x	I12
3111	J10
3112	J11
3116x	L 4
3119	K21
3120	L 8
3121	K20
3122	K21
3123	N20
3124x	O 8
3125x	O15
3128	M15
3129x	O13
3132	M12
3141	D18
3142	G14
3144	H18
3147	I 9
3148	J 9
3149	J 9
3151	C 4
3154	B12
3155	C12
3156	D19
3157	I 7
3158x	O 2
3160	C13
3161	C14
3162	B15
3163	C15
3164	B16
3165	C16
3166	F27
3167A	J29
3170	N18
3171	F29
3172	N17
3173	M16
3174	M16
3175	N17
3176	K10
3177x	O18
3178	I22
3179	J26
3180	C18
3181	C18
3183	E22
3184	E22
3185	I24
3186A	I27
3188	H25
3189	E29
3190	E29
3191	E29
3192	E29
3193	M18
3194	G31
3195	H31
3197A	H31
3220	J14
3222o	P 3
3223x	N 4
3224	M14
3226o	N14
3229o	O14
3233	M 5
3238x	N 9
3241o	O11
3242	M11
3243o	N10
3244	M 9
3245x	N 4
3248	C 5
3249x	I11
5105x	P 2
5106o	O 3
5109	I 7
5120	J 8
5122x	O10
5123	N10
5140	A 5
5142	A 8
5143	D 7
5144	D 9
5145	C10
5150	I10
5170	G25
5171	I23
6105	O25
6109	J 7
6121	E21
6122	E21
6123	E21
6124	K 8
6140	I 9
6154	D18
6174A	I29
7102x	P 4
7104x	N 5
7105	I 7
7120	L20
7121x	O 8
7123x	O13
7128x	N15
7140	E 5
7150	J14
7150	J11
7150	A13
7150	C14
7150	B14
7150	B13
7152x	I12
7156	B16
7157	C16
7169	G27
7170	O17
7171	O17
7172	H16
7172	D20
7172	O20
7172	N22
7172	N20
7172	O22
7173	H24
7174	D17
7178	J25
7179x	O18
9197	C 3
9199	J 6
T001	C 2
T002	D 2
T005	O 4
T007	D 6
T008	D 6
T009	G 6
T010	H10
T011	H10
T012	C 8
T013	C11
T014	B11
T015	M16
T016	I29
T020	B29
T021	C29
T022	C29
T023	C29
T027	D30
T028	E30
T029	E30
T030	E30
T031	E30
T032	F30
T033	F30
T036	O17
T038	F22

1101	B	1
1153	E	5
1173	E	6
2100	A	1
2104	C	1
2115	C	2
2124	C	4
2129x	B	6
2130	B	5
2134	C	6
2135	B	4
2141	D	2
2142	C	4
2150	C	2
2151	C	2
2156	D	3
2157	E	3
2160	E	3
2161	E	4
2162	D	3
2172	C	6
2173	C	6
2177x	C	6
2178	C	4
2179	C	4
2184	D	5
3119	C	4
3120	B	3
3124x	B	6
3132	B	5
3141	D	3
3148	C	3
3151	D	1
3156	C	4
3162	E	4
3163	E	4
3164	E	4
3165	E	4
3170	C	6
3173	C	6
3174	C	5
3177x	A	6
3181	D	5
3189	D	6
3190	D	6
3191	D	6
3192	D	6
3193	E	6
3194	D	4
3195	D	4
3197	E	4
5105x	A	4
5106o	A	4
5109	C	2
5120	C	3
5122x	B	5
5123	B	5
5140	D	2
5142	D	3
5143	D	2
5144	D	2
5145	D	3
5150	D	3
5170	D	6
5171	D	5
6121	D	5
6122	D	5
6123	D	6
6140	D	4
6154	C	4
6174	D	4
7105	C	2
7120	C	4
7156	E	4
7157	E	4
9100	E	6
9101	E	5
9103	C	6
9105	C	4
9106	C	4
9107	C	5
9108	D	4
9110	E	5
9115	D	5
9119	C	5
9120	C	2
9122	B	4
9123	D	4
9124	E	1
9125	C	2
9126	B	4
9128	D	4
9129	C	4
9130	D	4
9132	C	3
9134	B	2
9197	C	1
9199	B	3

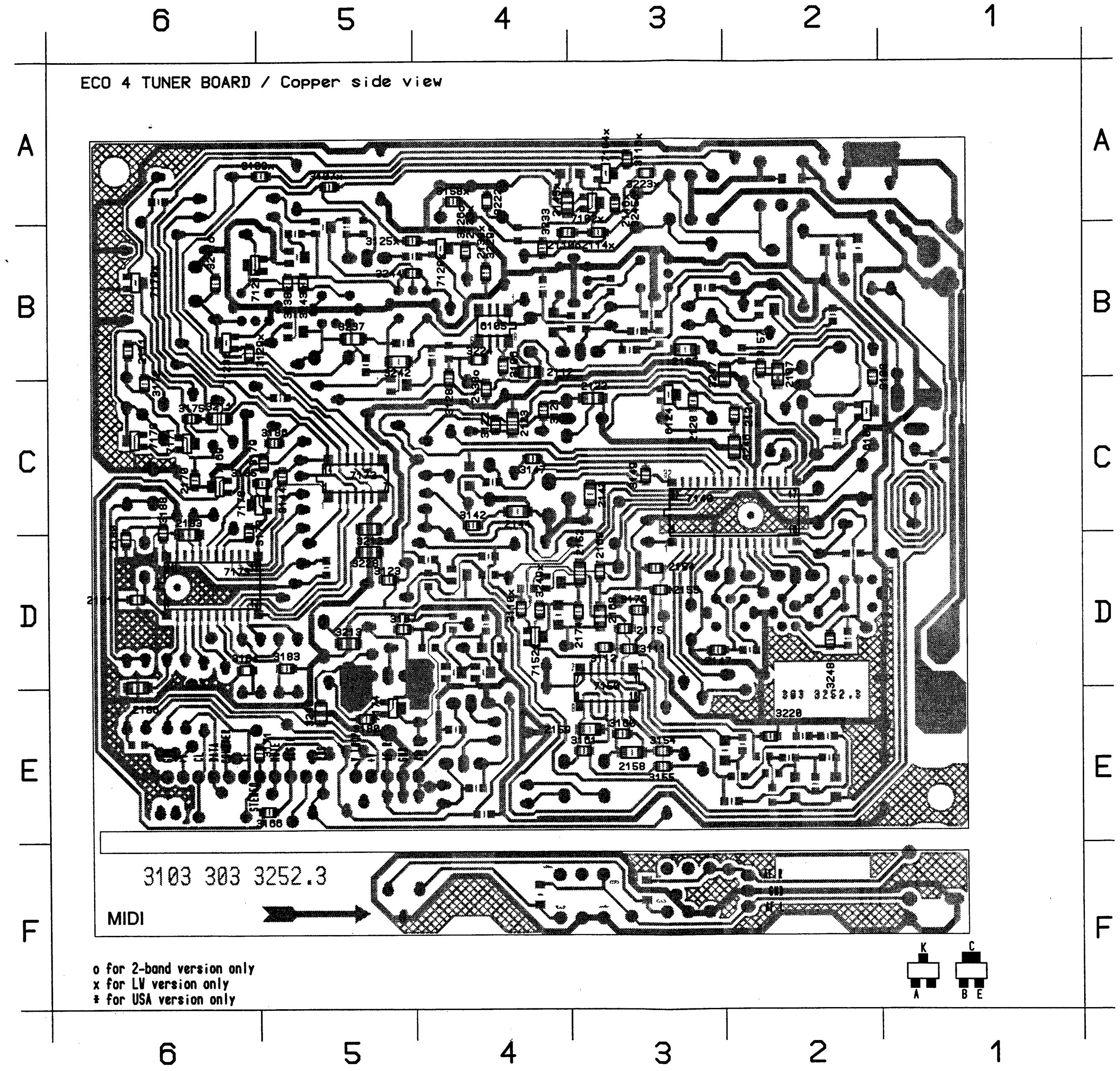
ECO 4 TUNER BOARD / Component side view



o for 2-band version only
x for LW version only
* for USA version only

7171	C	6
7172	C	5
7173	D	6
7174	E	5
7178	C	5
7179x	B	6
6109	C	2
6124	C	3
7102x	A	3
7104x	A	3
7121x	B	6
7123x	B	6
7128x	B	4
7140	C	2
7150	D	3
7152x	D	4
7169	C	6
7170	C	6
3238x	B	5
3240	E	5
3241o	B	6
3242	B	5
3243o	B	5
3244	B	4
3245x	A	3
3246	C	2
3247	B	2
3248	D	2
3249x	D	4
6105	B	4
3211	C	6
3212	C	5
3213	D	5
3220	E	2
3222o	A	4
3223x	A	3
3224	B	4
3226o	B	4
3228	D	5
3229o	B	4
3233	B	4
3237	B	5
3171	E	5
3172	C	6
3175	C	6
3176	D	3
3178	C	6
3179	C	5
3180	E	5
3183	D	5
3184	D	6
3185	C	5
3186	C	5
3188	C	6
3142	C	4
3144	C	5
3147	C	4
3149	C	3
3154	E	3
3155	E	3
3157	B	2
3158x	A	4
3160	E	3
3161	E	3
3166	E	5
3167	D	5
3108	B	2
3109x	A	5
3110x	D	4
3111	D	3
3112	D	3
3116x	A	3
3121	C	4
3122	C	4
3123	D	5
3125x	B	4
3128	B	4
3129x	B	6
2169	D	3
2170	C	6
2171	B	6
2174	D	3
2175	D	3
2180	D	6
2181	D	6
2183	C	6
2185	B	3
2186	D	6
3106	B	4
3107x	A	5
2139x	B	4
2143	C	3
2144	C	4
2145x	A	3
2146x	A	3
2147	D	3
2152	D	3
2154	D	3
2155	D	3
2158	E	3
2159	E	3
2168	D	3
T036	B	6
T038	D	6
2107	B	2
2110o	B	3
2112	B	4
2114x	B	3
2120	C	3
2121	C	2
2122	C	3
2123	C	4
2133x	B	4
2138o	C	4
T016	A	6
T020	E	4
T021	E	4
T022	E	5
T023	D	5
T027	E	6
T028	E	6
T029	E	6
T030	E	6
T031	E	6
T032	E	5
T033	E	5
T001	B	1
T002	B	1
T005	E	1
T007	D	2
T008	D	2
T009	B	2
T010	D	3
T011	C	3
T012	D	2
T013	E	2
T014	D	3
T015	C	6

ECO 4 TUNER BOARD / Copper side view



o for 2-band version only
x for LV version only
* for USA version only

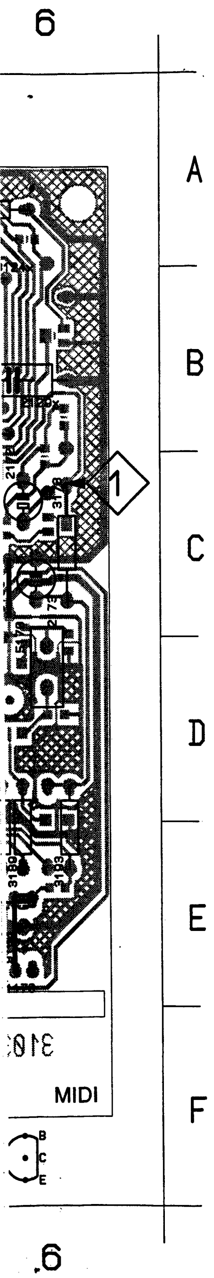
TUNE

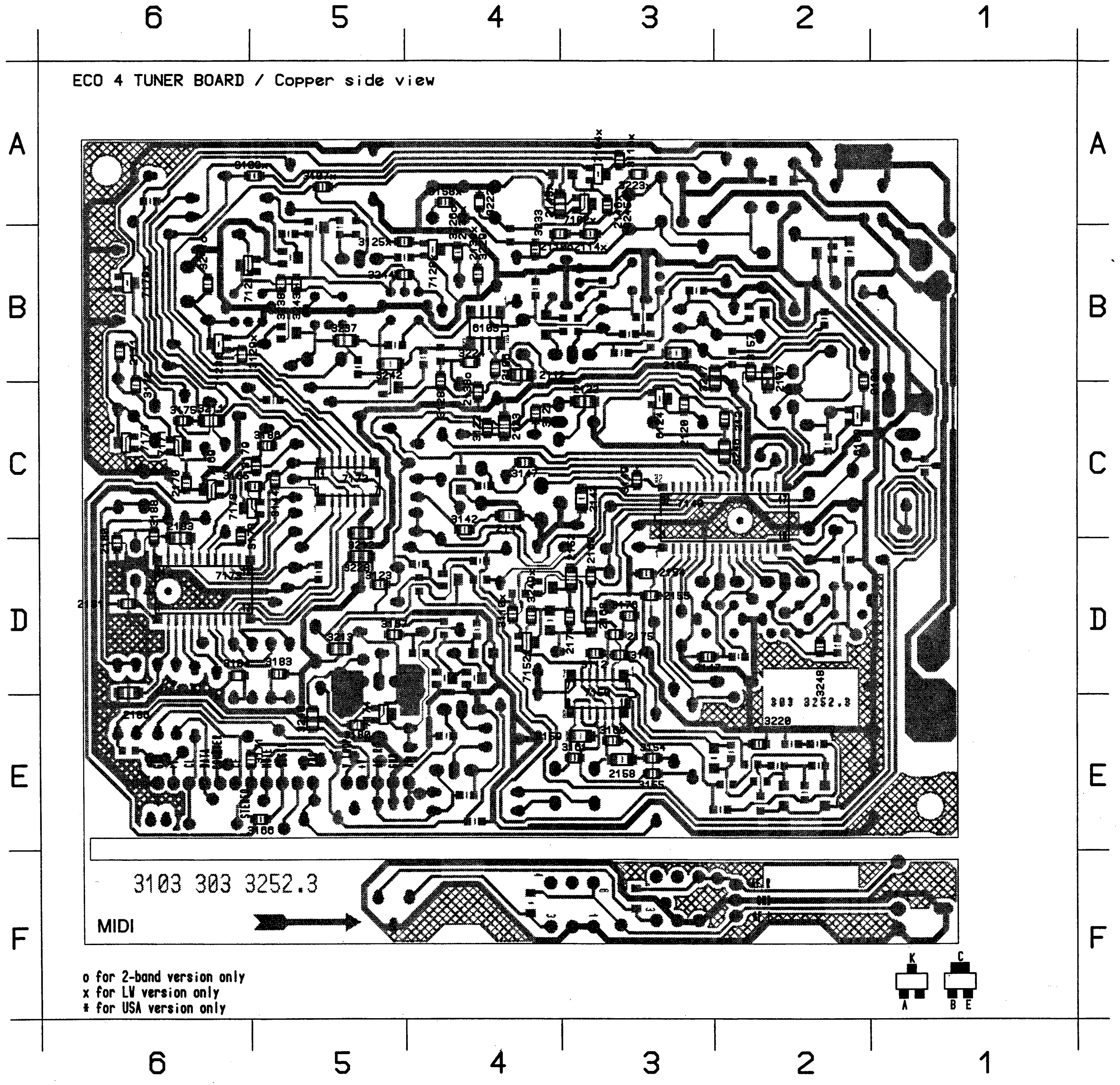
V
VARIC
FM /0(87.5
FM /14 65.8
MW /0 2-band v 530
LW /0(153
MW /0 522
FM - F
FM /0(
FM /14 East
VCO
FM
AM - I.
MW
AM - F
LW
MW /0 3-b
MW /0 2-b

* Use S
1) Adjus
brack

repea

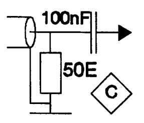
7171	C 6
7172	C 5
7173	D 6
7174	E 5
7178	C 5
7179x	B 6
6109	C 2
6124	C 3
7102x	A 3
7104x	A 3
7121x	B 6
7123x	B 6
7128x	B 4
7140	C 2
7150	D 3
7152x	D 4
7169	C 6
7170	C 6
3238x	B 5
3240	E 5
3241o	B 6
3242	B 5
3243o	B 5
3244	B 4
3245x	A 3
3246	C 2
3247	B 2
3248	D 2
3249x	D 4
6105	B 4
3211	C 6
3212	C 5
3213	D 5
3220	E 2
3222o	A 4
3223x	A 3
3224	B 4
3226o	B 4
3228	D 5
3229o	B 4
3233	B 4
3237	B 5
3171	E 5
3172	C 6
3175	C 6
3176	D 3
3178	C 6
3179	C 5
3180	E 5
3183	D 5
3184	D 6
3185	C 5
3186	C 5
3188	C 6
3142	C 4
3144	C 5
3147	C 4
3149	C 3
3154	E 3
3155	E 3
3157	B 2
3158x	A 4
3160	E 3
3161	E 3
3166	E 5
3167	D 5
3108	B 2
3109x	A 5
3110x	D 4
3111	D 3
3112	D 3
3116x	A 3
3121	C 4
3122	C 4
3123	D 5
3125x	B 4
3128	B 4
3129x	B 6
2169	D 3
2170	C 6
2171	B 6
2174	D 3
2175	D 3
2180	D 6
2181	D 6
2183	C 6
2185	B 3
2186	D 6
3106	B 4
3107x	A 5
2139x	B 4
2143	C 3
2144	C 4
2145x	A 3
2146x	A 3
2147	D 3
2152	D 3
2154	D 3
2155	D 3
2158	E 3
2159	E 3
2168	D 3
T036	B 6
T038	D 6
2107	B 2
2110o	B 3
2112	B 4
2114x	B 3
2120	C 3
2121	C 2
2122	C 3
2123	C 4
2133x	B 4
2138o	C 4
T016	A 6
T020	E 4
T021	E 4
T022	E 5
T023	D 5
T027	E 6
T028	E 6
T029	E 6
T030	E 6
T031	E 6
T032	E 5
T033	E 5
T001	B 1
T002	B 1
T005	E 1
T007	D 2
T008	D 2
T009	B 2
T010	D 3
T011	C 3
T012	D 2
T013	E 2
T014	D 3
T015	C 6




ECO 4 TUNER BOARD / Copper side view

o for 2-band version only
x for LW version only
* for USA version only

TUNER Adjustment table (**ECO 4** FM/MW- and FM/MW/LW - versions with AM-ferrite antenna)

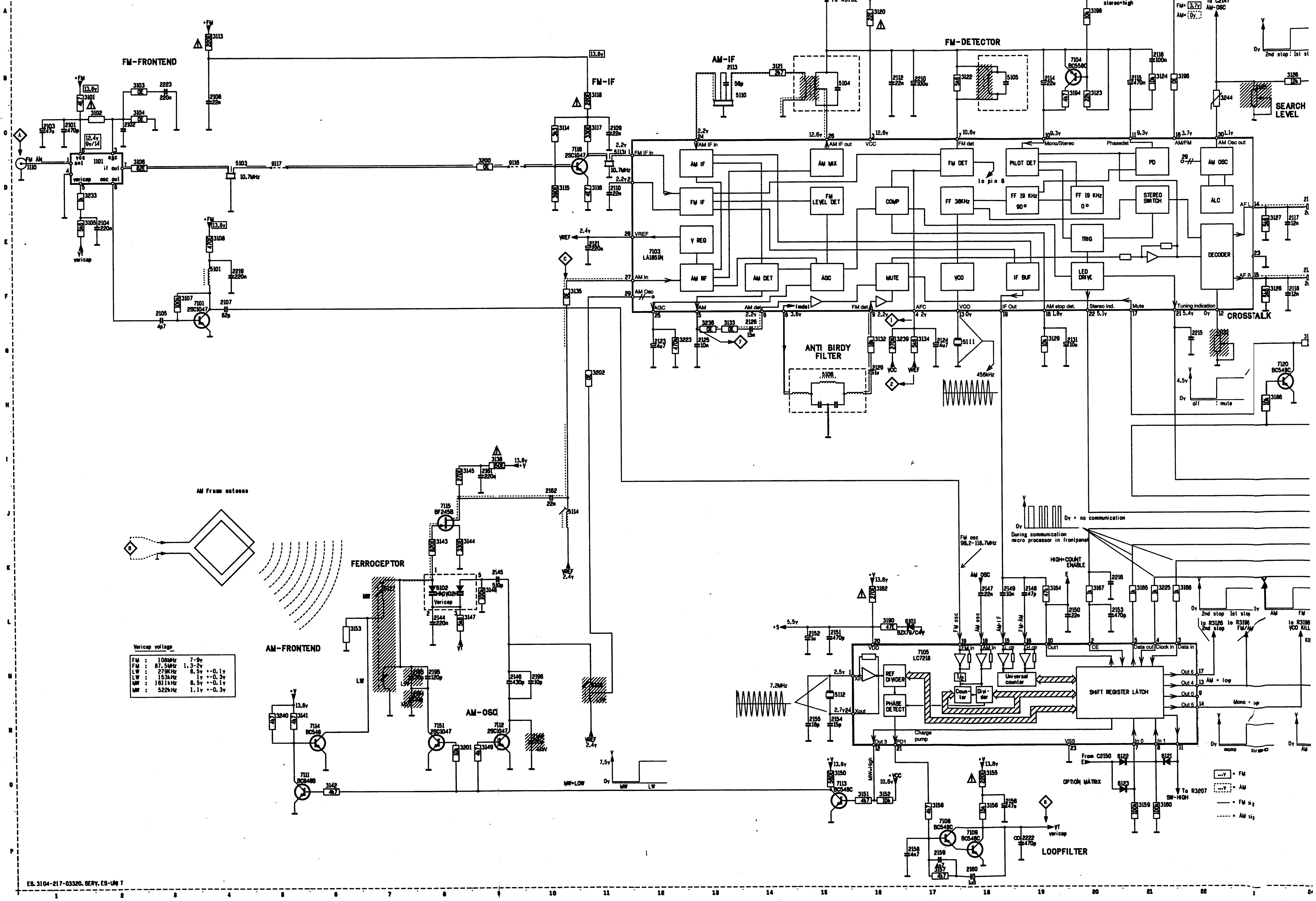
Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT * 1)						
FM /00/01/05/10/17			108 MHz	5120	1	8V ± 0.2V
87.5 - 108MHz			87.5MHz	check		4.1V ± 0.5V
FM /14 East Europe			108 MHz	5120		8V ± 0.2V
65.81 - 108MHz			65.81 MHz	check		0.8V ± 0.4V
MW /01/17 2-band version, 10kHz grid			1710kHz	5123		9V±0.1V (7.5±0.7V) 1)
530 - 1710kHz			530kHz	check		1V±0.4V (1.1±0.5V) 1)
LW /00/05/10/14			279kHz	5122		8V±0.2V (7.5±1.5V) 1)
153 - 279kHz			153kHz	check		1V±0.4V (1.1±0.5V) 1)
MW /00/05/10/14			1611kHz	5123		8V±0.1V (7.5±0.5V) 1)
522 - 1611kHz			522kHz	check		1V±0.4V (1.1±0.5V) 1)
FM - RF						
FM /00/01/05/10/17	108MHz	A mod=1kHz Δf=22.5kHz	108MHz	2115	3	MAX ↕
	87.5MHz		87.5MHz	5109		
FM /14 East Europe	108MHz		108MHz	2115		
	65.81MHz		65.81MHz	5109		
VCO						
FM	98 MHz, 1mV continuous wave	A	98MHz	3148	2	152kHz ± 1kHz
AM - IF						
MW	540kHz Δf = 10kHz as low as possible	 100nF 50E C	540kHz	5142 5140	4	symmetrical and max height
AM - RF						
LW	198kHz	B' mod=1kHz 30% AM	198kHz	5122	4	MAX
MW /00/05/10/14 3-band version	1494kHz		1494kHz	2130		MAX ↕
	549kHz		549kHz	5123		
MW /01/17 2-band version	1500kHz		1500kHz	2130		
	550kHz		550kHz	5123		

* Use Service Test Program. By selecting the TUNER TEST, test frequencies will be stored as preset frequ. automatically.

1) Adjustment of AM-RF stage influences the varicap voltage. Therefore check if varicap voltage fulfils value stated within brackets after AM-RF adjustment.

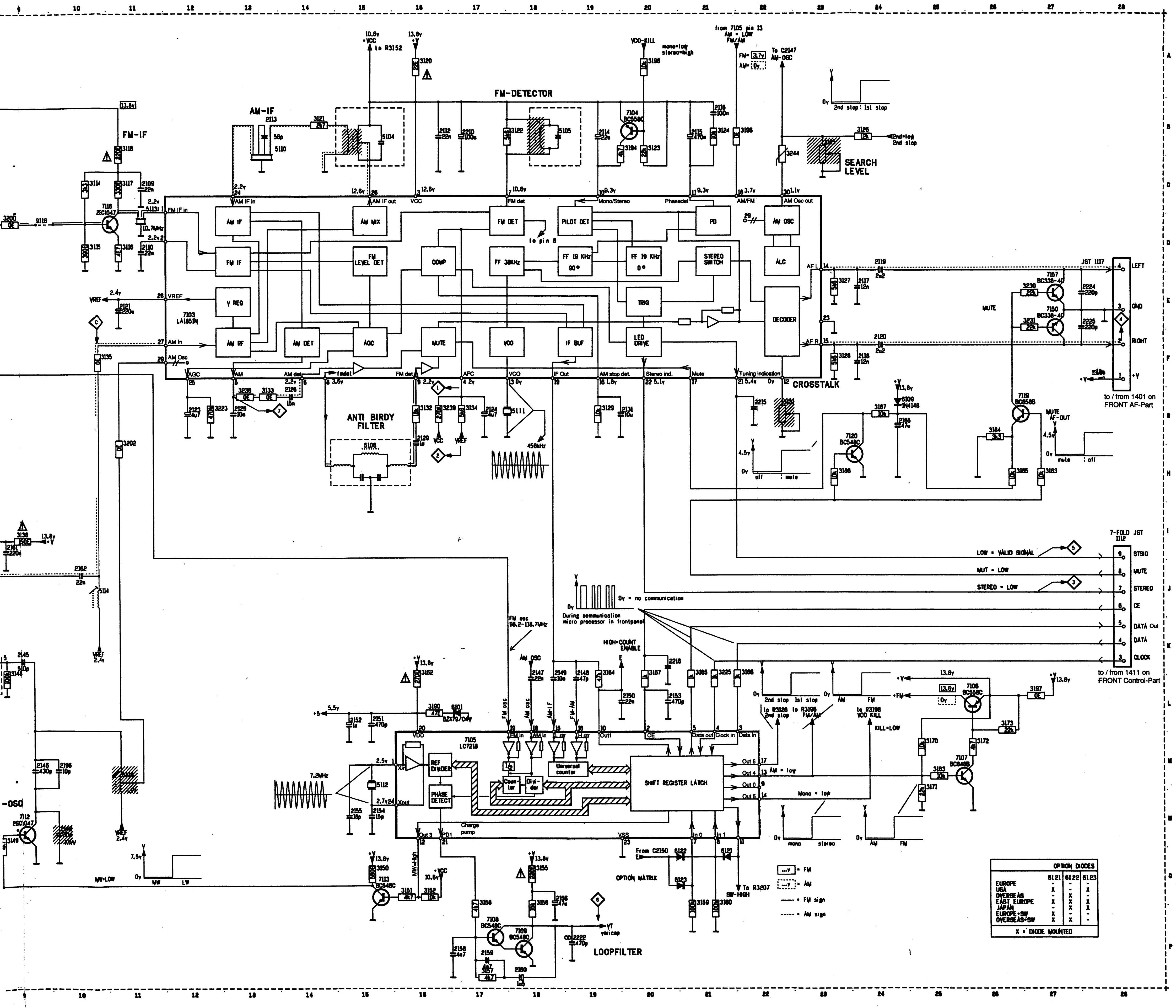
↕ repeat

TUNER 92


FM-FRONTEND
FM-IF
AM-IF
FM-DETECTOR
SEARCH LEVEL
CROSSTALK
ANTI BIRDY FILTER
AM Frame antenne
FERROCEPTOR
AM-FRONTEND
AM-OSC
LOOPFILTER
OPTION MATRIX
7103 LA1851N
AM IF
FM IF
V REG
AM RF
AM MIX
FM LEVEL DET
AM DET
AGC
COMP
MUTE
FM DET
FF 38KHz
VCO
PILOT DET
FF 19 KHz 90°
FF 19 KHz 0°
IF BUF
TRIG
LED DRIVE
PD
STEREO SWITCH
AM OSC
ALC
DECODER
FM IF in
VREF
AM In
AM Osc
AM IF in
AM IF out
VCC
FM det
Mono/Stereo
Phasedet
AM/FM
AM Osc out
AF L
AF R
AGC
AM
AM det
fmdet
FM det
AFC
VCO
IF Out
AM stop det.
Stereo ind.
Mute
Tuning indication
to pin 8
456kHz
10.7MHz
7105 LC7218
REF DIVIDER
PHASE DETECT
Counter
Divider
Universal counter
SHIFT REGISTER LATCH
VDD
Xin
Xout
FM in
AM in
L ctr
H ctr
Out1
CE
Data out
Clock in
Data in
Out 6
Out 4
Out 0
Out 5
Out 3
PD1
Charge pump
VSS
In 0
In 1
7.2MHz
FM osc 98,2-118,7MHz
AM OSC
HIGH=COUNT ENABLE
0v = no communication
During communication micro processor in frontpanel
AM = low
Mono = low
MW=High
MW=LOW
MW
LW
From C2150
To R3207
SW-HIGH
to R3126 2nd stop
to R3196 FM/AM
to R3198 VCO KILL
from 7105 pin 13 AM = LOW FM/AM
To C2147 AM-OSC
VCO-KILL
mono=low stereo=high
2nd stop
1st stop
= FM
= AM
= FM sig
= AM sig
7116 2SC1047
7101 2SC1047
7104 BC558C
7115 BF245B
7114 BC548
7111 BC848B
7151 2SC1047
7112 2SC1047
7113 BC548C
7108 BC548C
7109 BC548C
7120 BC548C
6102 HN1V02H Varicap
BZX79/C4V7
ES.3104-217-03320.SERV.ES-UN T

Varicap voltage

FM	:	108MHz	7-9v	
FM	:	87.5MHz	1.3-2v	
LW	:	279KHz	8.5v	+-0.1v
LW	:	153kHz	1v	+-0.3v
MW	:	1611kHz	8.5v	+-0.1v
MW	:	522kHz	1.1v	+-0.3v

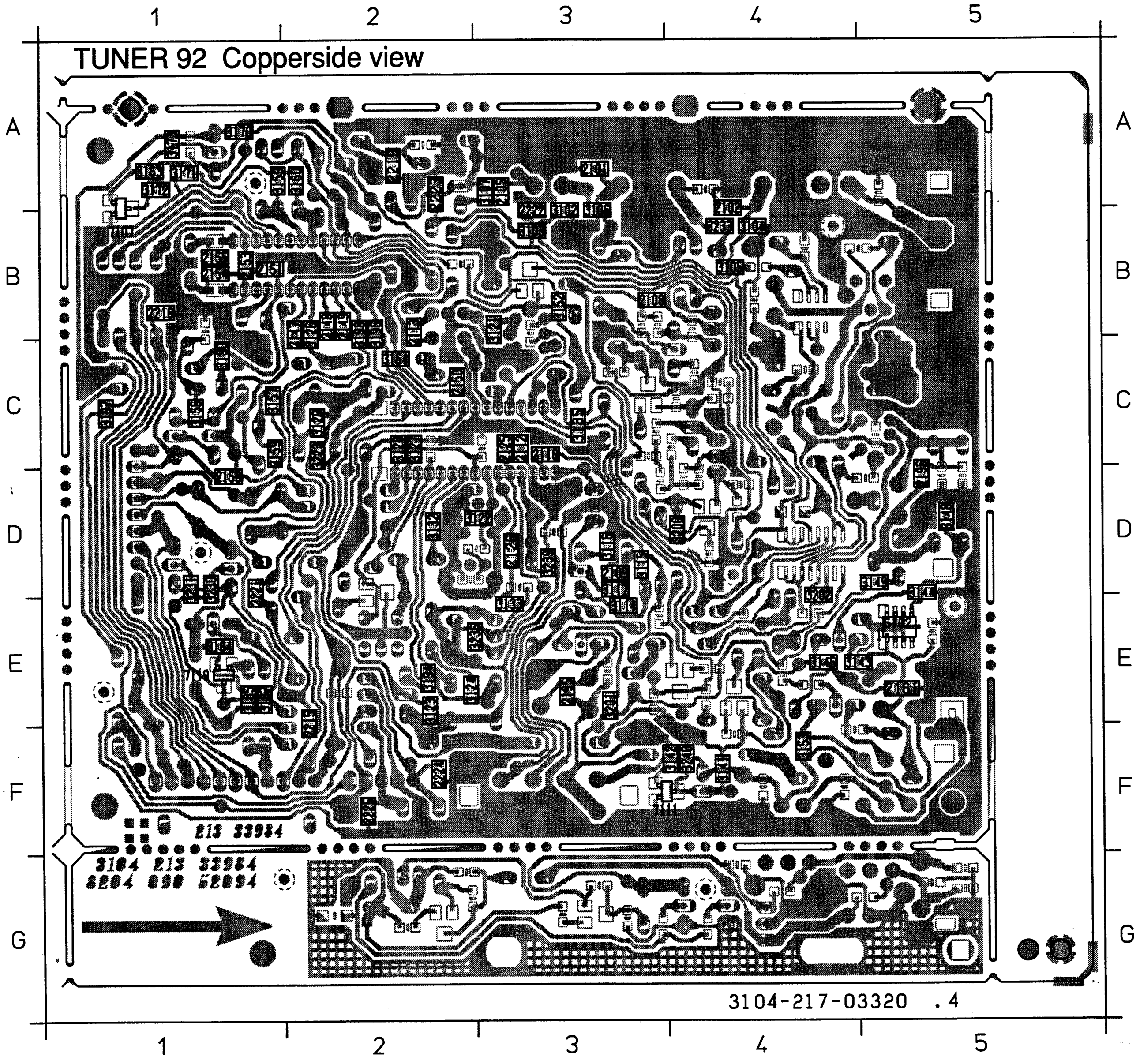

FM-IF
AM-IF
FM-DETECTOR
SEARCH LEVEL
CROSSTALK
ANTI BIRDY FILTER
LOOPFILTER
7103 LA1851N
7105 LC7218
AM IF
AM MIX
FM DET
PILOT DET
PD
AM OSC
FM IF
FM LEVEL DET
COMP
FF 38KHz
FF 19 KHz 90°
FF 19 KHz 0°
STEREO SWITCH
ALC
V REG
TRIG
DECODER
AM RF
AM DET
AGC
MUTE
VCO
IF BUF
LED DRIVE
REF DIVIDER
PHASE DETECT
Universal counter
SHIFT REGISTER LATCH
VCO-KILL
mono=low stereo=high
from 7105 pin 13 AM = LOW FM/AM
To C2147 AM-OSC
2nd stop : 1st stop
2nd=low 2nd stop
JST 1117
LEFT
GND
RIGHT
+V
to / from 1401 on FRONT AF-Part
MUTE AF-OUT
mute : off
off : muto
7-FOLD JST 1112
LOW = VALID SIGNAL
MUT = LOW
STEREO = LOW
STSIG
MUTE
STEREO
CE
DATA Out
DATA
CLOCK
to / from 1411 on FRONT Control-Part
0v = no communication
During communication micro processor in frontpanel
FM osc 98.2-118.7MHz
HIGH=COUNT ENABLE
to R3126 2nd stop
to R3198 FM/AM
to R3198 VCO KILL
KILL=LOW
AM = low
Mono = low
mono stereo
AM FM
From C2150
OPTION MATRIX
To R3207 SW-HIGH
= FM
= AM
= FM sign
= AM sign
MW=LOW
MW LW
-OSC
456kHz
7.2MHz
VT varicap
Charge pump
13.8v
10.8v
VCC
VREF

OPTION DIODES	6121	6122	6123
EUROPE	-	-	-
USA	X	-	X
OVERSEAS	-	X	-
EAST EUROPE	X	X	X
JAPAN	-	X	X
EUROPE+SW	X	-	-
OVERSEAS+SW	X	X	-
X = DIODE MOUNTED			

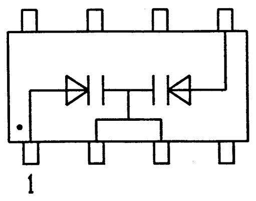
1101	D2
2101	C1
2102	C2
2103	C1
2104	E2
2105	F3
2107	F4
2108	B4
2109	C11
2110	D11
2112	B16
2113	B13
2114	B19
2115	B21
2116	B21
2117	E24
2118	F24
2119	D24
2120	F24
2121	E11
2123	G12
2124	G17
2125	G13
2126	G14
2129	G16
2131	G20
2141	K7
2142	N10
2144	L8
2145	K9
2146	N9
2147	K18
2148	K19
2149	K18
2150	L20
2151	L15
2152	L15
2153	L20
2154	N15
2155	N15
2156	O18
2158	P17
2159	P17
2160	P18
2161	I9
2162	J10
2165	G24
2193	N7
2194	N7
2195	N8
2196	N10
2197	N10
2210	B17
2215	G22
2216	K20
2219	F4
2221	G12
2222	P19
2223	B3
2224	E28
2225	E28
3101	B1
3102	C2
3103	B2
3104	C2
3105	E1
3106	D2
3107	F3
3108	E4
3113	A4
3114	C10
3115	D10
3116	D11
3117	C11
3118	B11
3120	A16
3121	B14
3122	B18
3123	B20
3124	B21
3126	B24
3127	E23
3128	F23
3129	G19
3132	G16
3133	G13
3134	G17
3135	F10
3138	I9
3141	N5
3142	O6
3143	K8
3144	K8
3145	I8
3147	L8
3148	K9
3149	N9
3150	O15
3151	O16
3152	O16
3153	L6
3155	O18
3156	O18
3157	P17
3158	O17
3159	O21
3160	O21
3162	K16
3163	M25
3164	K19
3165	K21
3166	K22
3167	K20
3170	M25
3171	N25
3172	M26
3173	L26
3183	M27
3184	G26
3185	H26
3186	H23
3187	G24
3190	L16
3194	B20
3196	B22
3197	L27
3198	A20
3200	D9
3201	N8
3202	G11
3223	G12
3225	K21
3230	E27
3231	E27
3233	D1
3236	G13
3239	G16
3240	N5
3244	B22
5104	B15
5105	B18
5106	M15
5111	D18
5111	G18
5112	M15
5127	K7
6101	L17
6102	K8
6109	G24
6121	O21
6122	O21
6123	O21
7101	F4
7103	E12
7104	B20
7105	M17
7106	L26
7107	M25
7108	P17
7109	P18
7111	O5
7112	N9
7113	O15
7114	N6
7115	J8
7116	C11
7119	G27
7120	G24
7150	E27
7151	N8
7157	E27
9116	D9
9117	D5

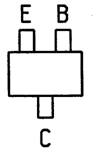
2101	A3	2125	C3	2154	B1	2216	B1	3103	B3	3117	D3	3129	C2	3145	E4	3160	A2	3185	E1	3201	E3	3240	F4
2102	B4	2126	D3	2155	B1	2219	A2	3104	B4	3121	B3	3132	D2	3148	D5	3163	A1	3187	E1	3202	E4	6102	E5
2105	A3	2147	B2	2158	D1	2221	D1	3105	B4	3122	D3	3133	E3	3149	D5	3164	C2	3190	C1	3223	C2	7107	B1
2108	B3	2148	B2	2159	C1	2222	B3	3106	B3	3123	E2	3135	C3	3152	B3	3170	A1	3194	E2	3230	D1	7111	F3
2109	D3	2149	B2	2161	E5	2223	A2	3107	A3	3124	E3	3141	F4	3153	F4	3171	A1	3196	B2	3231	D1	7119	E1
2110	C3	2150	C2	2195	E3	2224	F2	3114	E3	3126	B2	3142	F4	3156	C1	3172	A1	3197	C1	3233	B4	TUNER	A1
2112	C3	2151	B1	2196	D5	2225	F2	3115	D3	3127	C2	3143	E5	3157	C1	3173	A1	3198	B2	3236	E3		
2113	B2	2153	B1	2215	E2	3102	B3	3116	D3	3128	C2	3144	E5	3159	A2	3184	E1	3200	D4	3239	D3		

TUNER 92 Copperside view



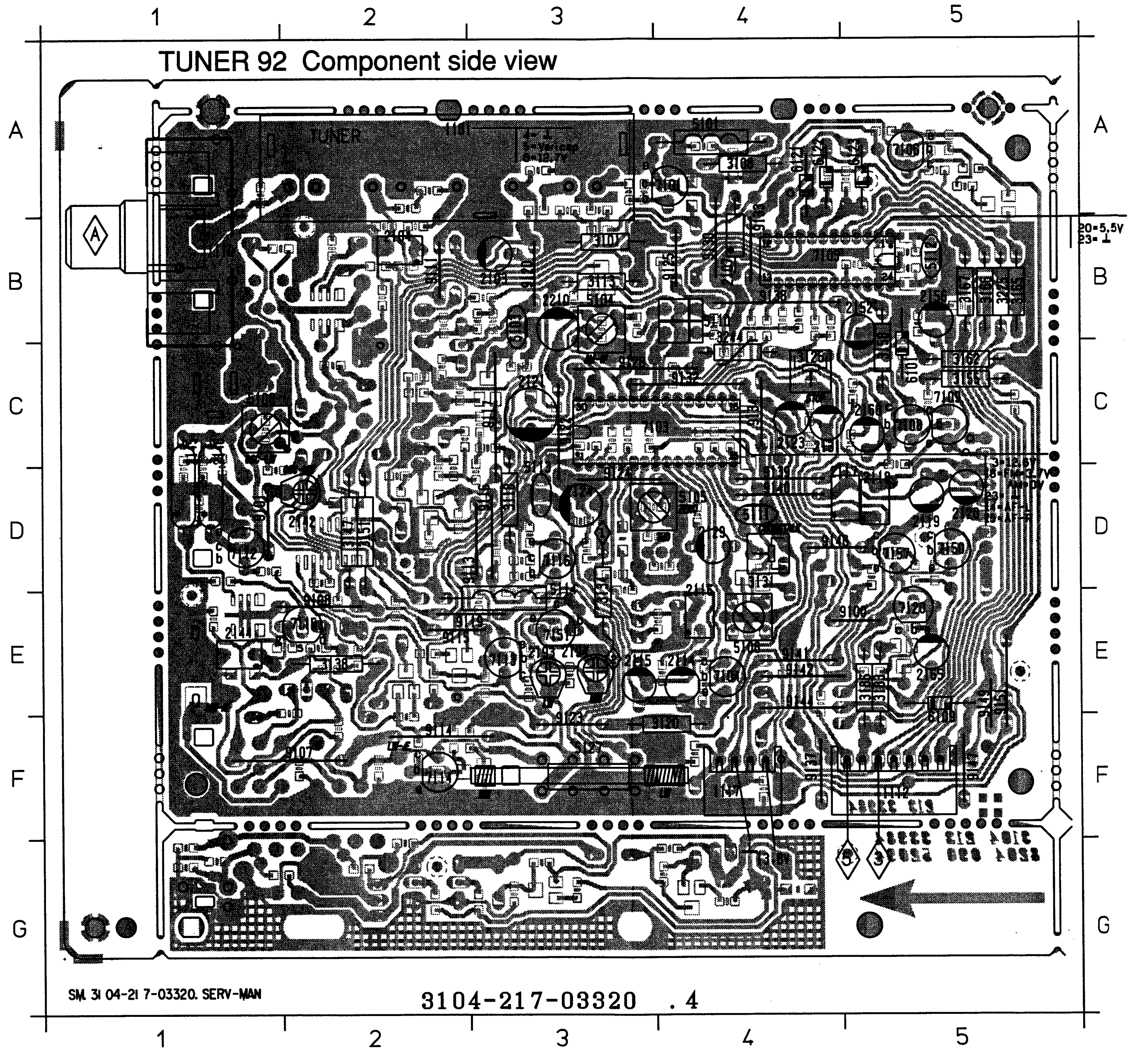
Ic 6102 - 6105



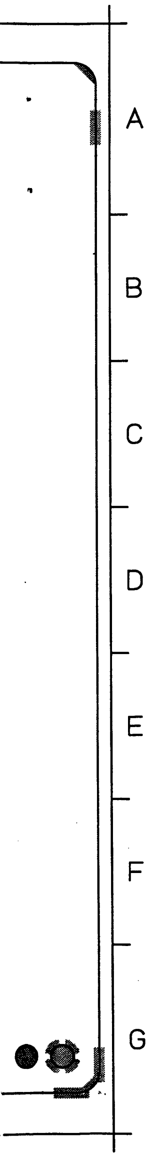


1101	A2	2119	D5	2156	B5	3131	D4	3186	E5	5113	D3	7106	A5	9100	E5	9122	C3	9140	D4
1110	B1	2120	D5	2160	C5	3134	D3	3225	B5	5114	E3	7108	C5	9101	D1	9123	F3	9141	E4
1112	F5	2121	C3	2165	E5	3138	E2	3244	C4	5127	F3	7109	C5	9107	F2	9124	D3	9142	E4
1117	F4	2123	C4	2193	E3	3147	D2	5101	A4	6101	C5	7112	D1	9108	E2	9125	B4	9144	E4
2103	B3	2124	D3	2194	E3	3151	D2	5103	B3	6109	F5	7113	E3	9111	B2	9128	C3	9146	D4
2104	B2	2129	D4	2210	B3	3155	C5	5104	B3	6121	A4	7114	F2	9113	D3	9130	B4	9147	F5
2107	B4	2131	C4	3101	B3	3158	C5	5105	D4	6122	A4	7115	E2	9114	F2	9132	C4	9149	E5
2114	E4	2142	D2	3108	A4	3162	C5	5106	E4	6123	A5	7116	D3	9115	E2	9133	B4	9151	E5
2115	E3	2144	E1	3113	B3	3165	B5	5108	C1	7101	A4	7120	E5	9116	D3	9134	C4		
2116	E4	2145	C1	3118	D3	3166	B5	5110	B4	7103	C4	7150	D5	9117	C3	9137	F4		
2117	D5	2146	C1	3120	F4	3167	B5	5111	D4	7104	E4	7151	E3	9119	E3	9138	B4		
2118	D5	2152	B5	3125	C4	3183	E5	5112	B5	7105	B4	7157	D5	9120	B3	9139	D4		

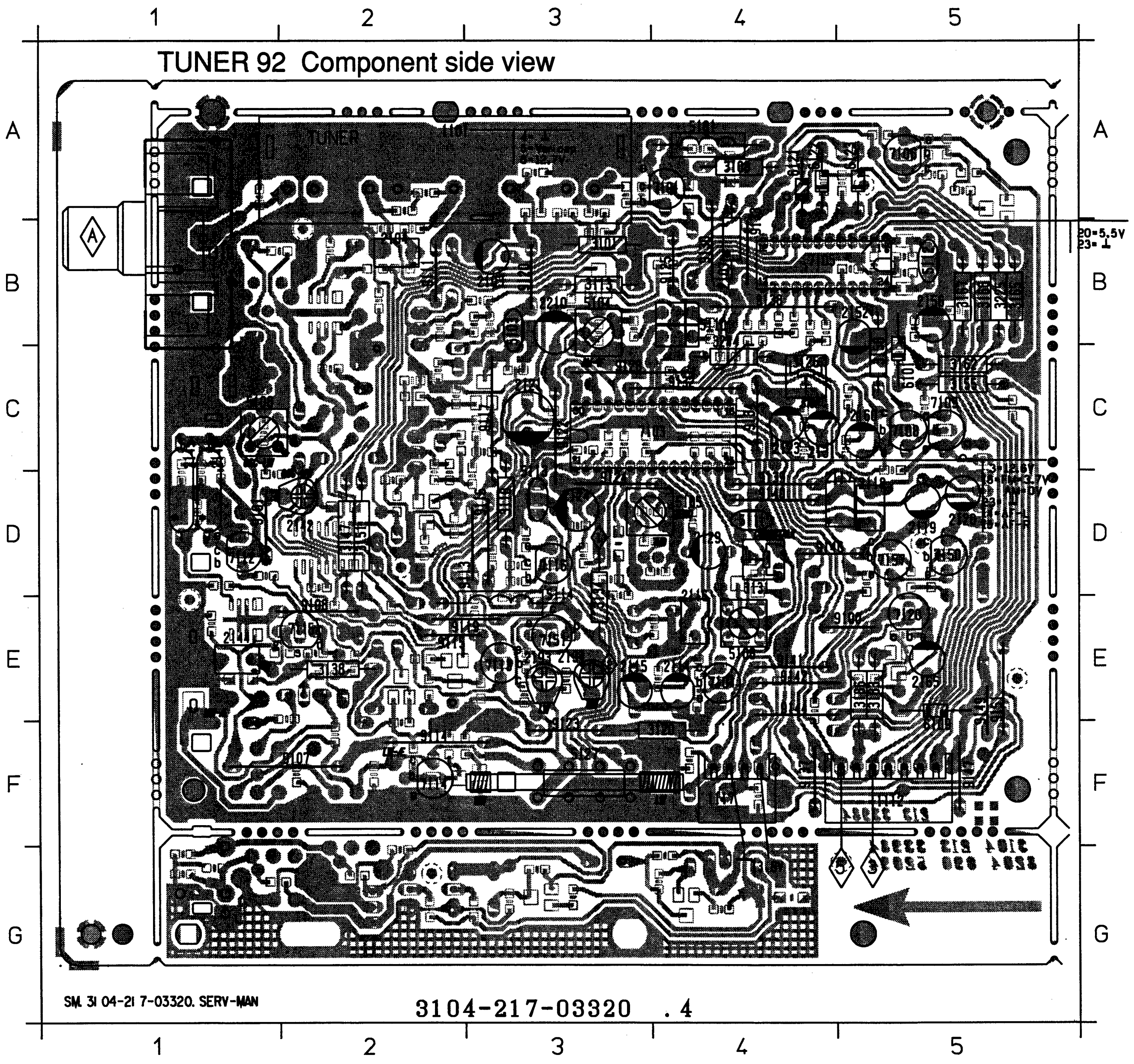
TUNER 92 Component side view



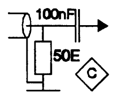
3240	F4
6102	E5
7107	B1
7111	F3
7119	E1
TUNER	A1



1101	A2
1110	B1
1112	F5
1117	F4
2103	B3
2104	B2
2107	B4
2114	E4
2115	E3
2116	E4
2117	D5
2118	D5
2119	D5
2120	D5
2121	C3
2123	C4
2124	D3
2129	D4
2131	C4
2142	D2
2144	E1
2145	C1
2146	C1
2152	B5
2156	B5
2160	C5
2165	E5
2193	E3
2194	E3
2210	B3
3101	B3
3108	A4
3113	B3
3118	D3
3120	F4
3125	C4
3131	D4
3134	D3
3138	E2
3147	D2
3151	D2
3155	C5
3158	C5
3162	C5
3165	B5
3166	B5
3167	B5
3183	E5
3186	E5
3225	B5
3244	C4
5101	A4
5103	B3
5104	B3
5105	D4
5106	E4
5108	C1
5110	B4
5111	D4
5112	B5
5113	D3
5114	E3
5127	F3
6101	C5
6109	F5
6121	A4
6122	A4
6123	A5
7101	A4
7103	C4
7104	E4
7105	B4
7106	A5
7108	C5
7109	C5
7112	D1
7113	E3
7114	F2
7115	E2
7116	D3
7120	E5
7150	D5
7151	E3
7157	D5
9100	E5
9101	D1
9107	F2
9108	E2
9111	B2
9113	D3
9114	F2
9115	E2
9116	D3
9117	C3
9119	E3
9120	B3
9122	C3
9123	F3
9124	D3
9125	B4
9128	C3
9130	B4
9132	C4
9133	B4
9134	C4
9137	F4
9138	B4
9139	D4
9140	D4
9141	E4
9142	E4
9144	E4
9146	D4
9147	F5
9149	E5
9151	E5

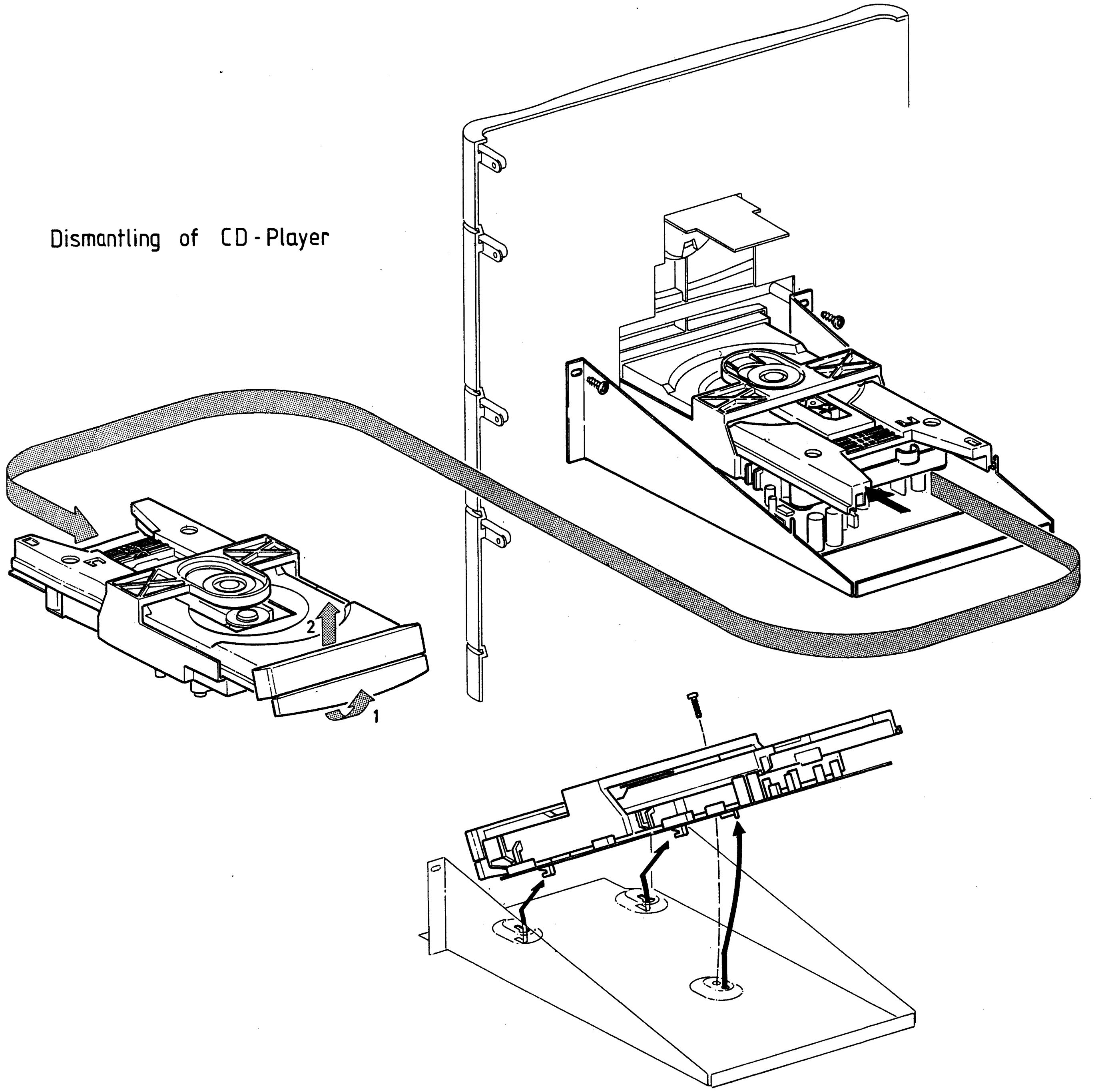

TUNER 92 Component side view

TUNER 92 Adjustment table (FM, MW - and FM, MW, LW - versions with AM ferrite antenna)

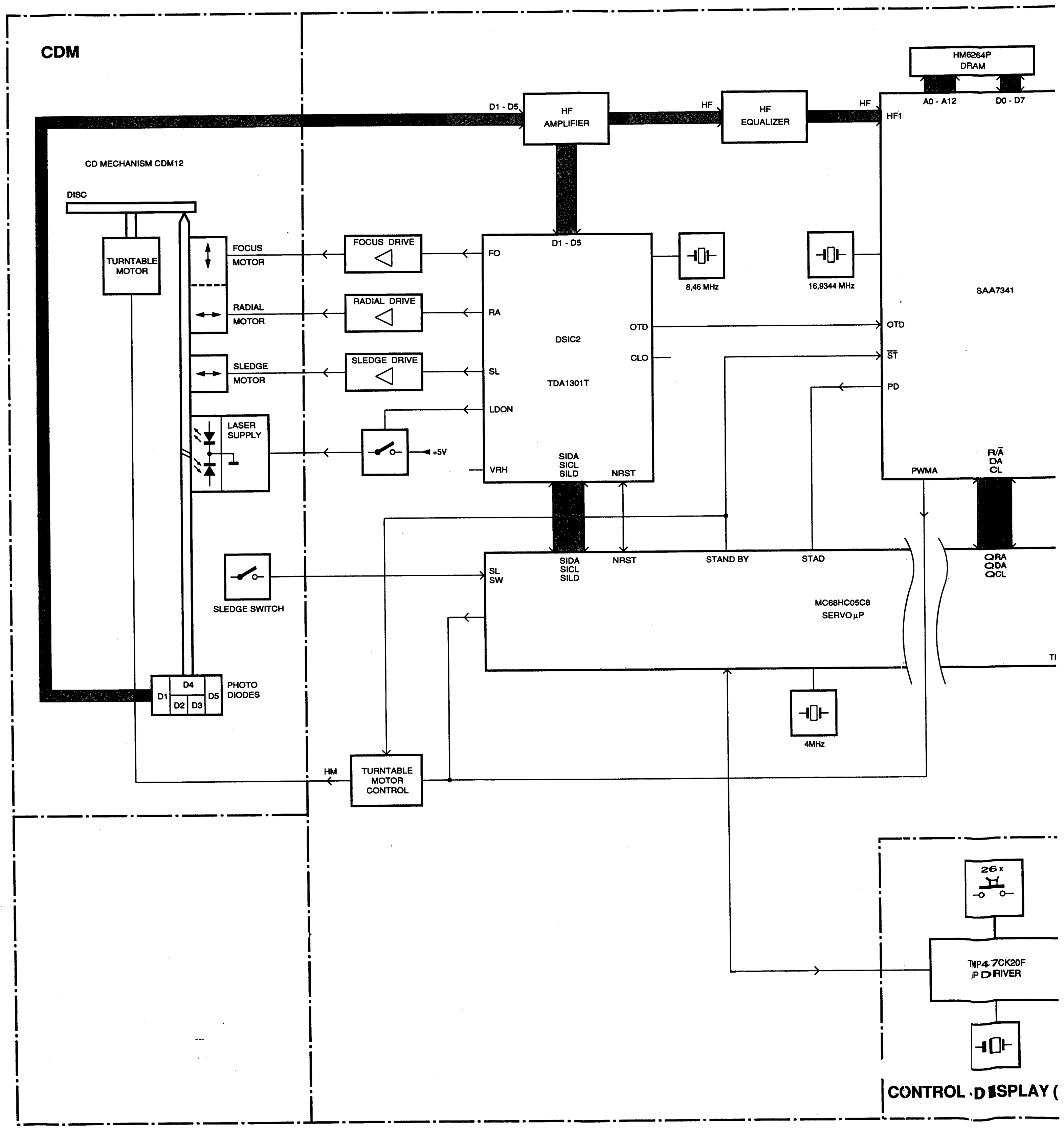
Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT						
FM			108 MHz	check	◇6	7....9V
87.5 - 108MHz			87.5MHz	check		1.3,...2V
AM			1710kHz	5108		8.5V ± 0.1V
2-band version, 10kHz grid 530 - 1710kHz			530kHz	check		1V ± 0.3V
LW			279kHz	5108		8.5V ± 0.1V
153 - 279kHz			153kHz	check		1V ± 0.1V
MW			1611kHz	2142		8.5V ± 0.1V
522 - 1611kHz			522kHz	check		1.1V ± 0.3V
FM IF						
FM	98 MHz, 1mV mod = 1kHz Δf = 75kHz	◇A	98MHz	5105	◇1 ◇2	0V ± 20mV
STEREO CROSSTALK						
FM	98 MHz, 1mV 90% Left +9% pilot	◇A	98MHz	check	◇3	low < 1V
				3131	◇4	Right channel minimum
SEARCH SENSITIVITY						
FM	98 MHz, 15µV mod = 1kHz Δf = 75kHz	◇A	98MHz	3125	◇5	Switches just from High to Low
AM - IF						
MW	1494kHz Δf = 10kHz as low as possible		1494kHz	5104	◇7	symmetrical and max height
AM RF						
AM 2-band version, 10kHz grid	560kHz	◇B	560kHz	5107	◇7	MAX. ↕
m=30%, 1kHz	1600kHz		1600kHz	2141		
LW	155kHz		155kHz	5127 LW		
m=30%, 1kHZ	270kHz		270kHz	2193		
MW	558kHz		558kHz	5127 MW		
m=30%, 1kHz	1494kHz		1494kHz	2194		

↕ repeat

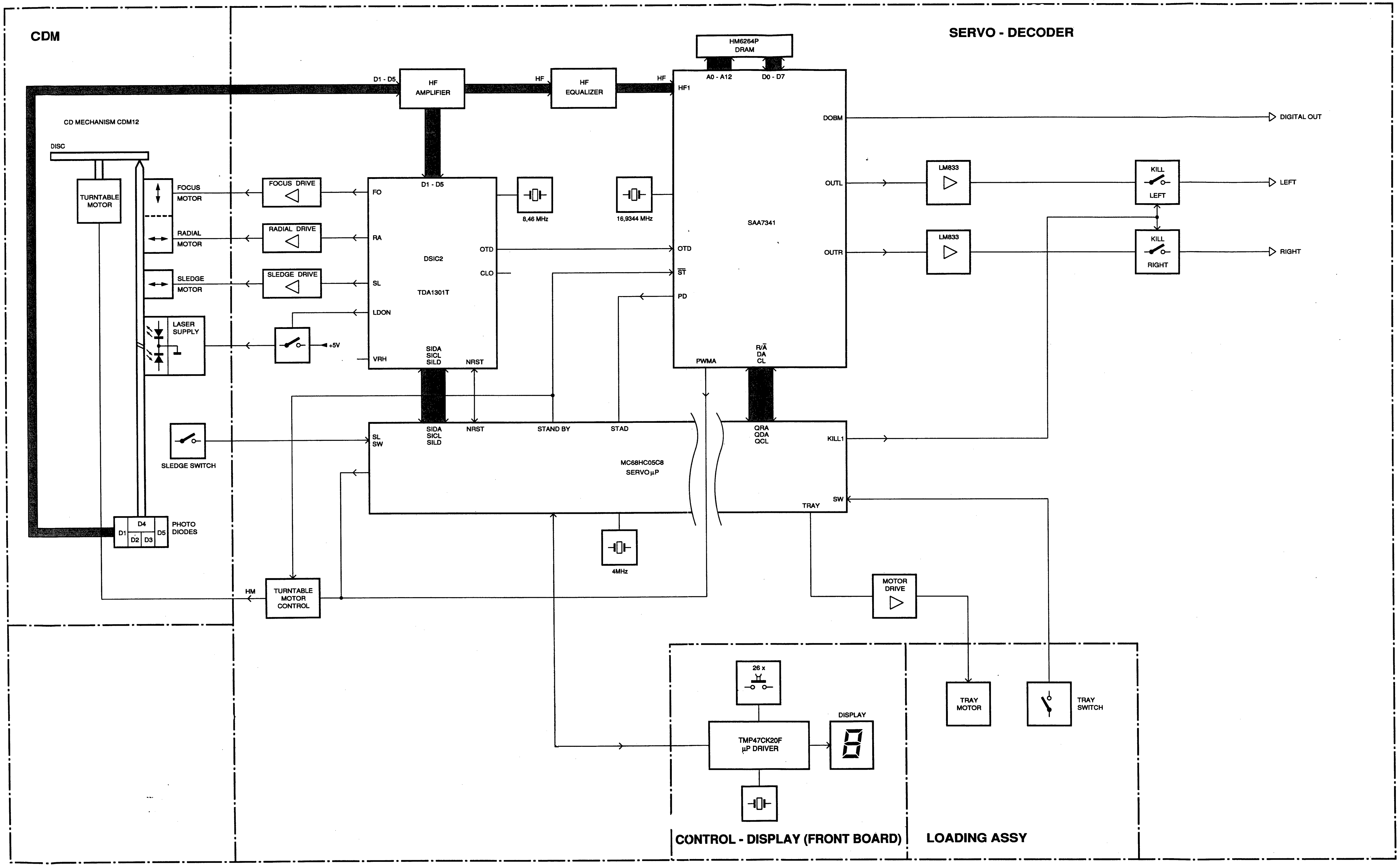
Dismantling of CD-Player



BLOCK DIAGRAM

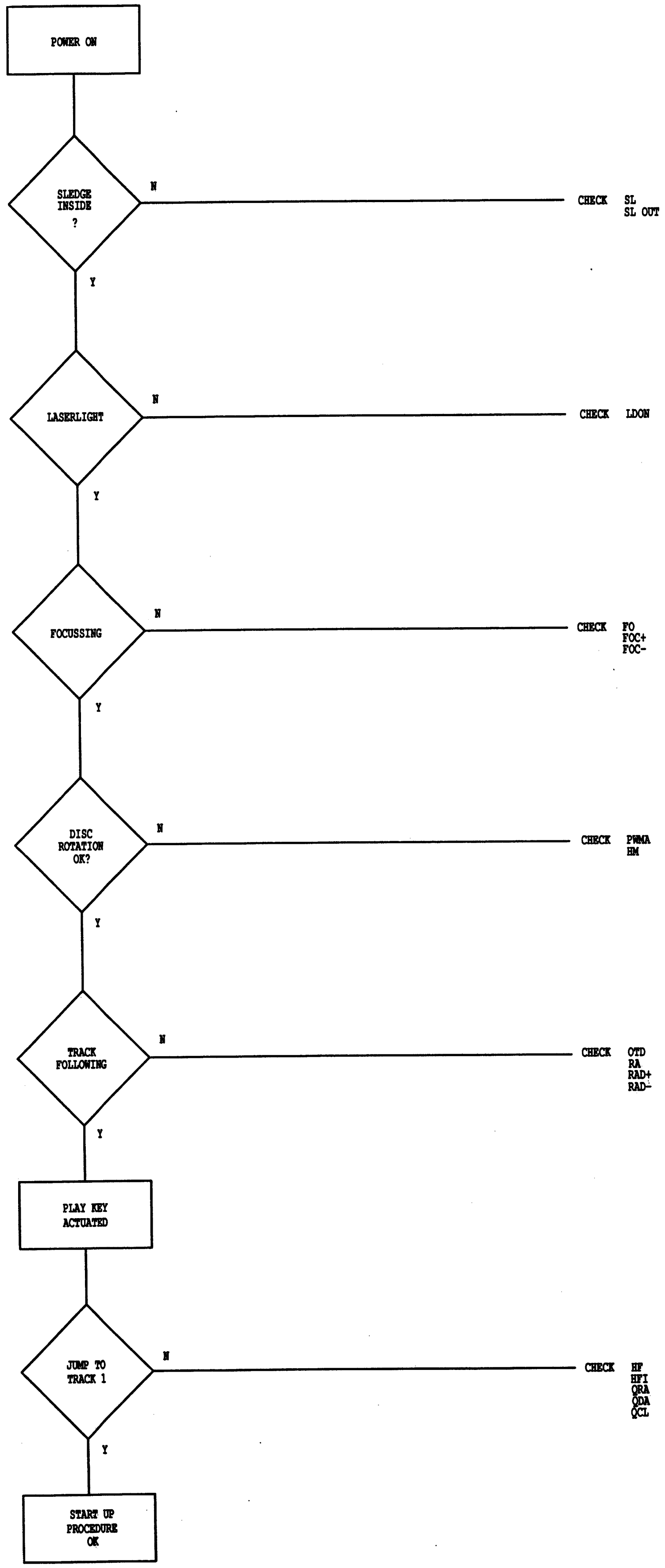

CDM
CD MECHANISM CDM12
DISC
TURNTABLE MOTOR
FOCUS MOTOR
RADIAL MOTOR
SLEDGE MOTOR
LASER SUPPLY
SLEDGE SWITCH
D4
D1
D5
D2
D3
PHOTO DIODES
FOCUS DRIVE
RADIAL DRIVE
SLEDGE DRIVE
+5V
D1 - D5
HF AMPLIFIER
HF
HF EQUALIZER
HF
HM6264P DRAM
A0 - A12
D0 - D7
HF1
D1 - D5
FO
RA
SL
LDON
VRH
DSIC2
TDA1301T
OTD
CLO
SIDA
SICL
SILD
NRST
8,46 MHz
16,9344 MHz
SAA7341
OTD
ST
PD
PWMA
R/Ā
DA
CL
QRA
QDA
QCL
SL
SW
SIDA
SICL
SILD
NRST
STAND BY
STAD
MC68HC05C8
SERVO µP
TI
4MHz
HM
TURNTABLE MOTOR CONTROL
26 x
TMP47CK20F
µP DRIVER
CONTROL · DISPLAY (

BLOCK DIAGRAM


CDM
SERVO - DECODER
CD MECHANISM CDM12
DISC
TURNTABLE MOTOR
FOCUS MOTOR
RADIAL MOTOR
SLEDGE MOTOR
LASER SUPPLY
SLEDGE SWITCH
PHOTO DIODES
D1
D2
D3
D4
D5
D1 - D5
HF AMPLIFIER
HF
HF EQUALIZER
HF
HM6264P DRAM
A0 - A12
D0 - D7
HF1
FOCUS DRIVE
RADIAL DRIVE
SLEDGE DRIVE
+5V
FO
RA
SL
LDON
VRH
D1 - D5
DSIC2
TDA1301T
OTD
CLO
SIDA
SICL
SILD
NRST
8,46 MHz
16,9344 MHz
SAA7341
OTD
ST
PD
PWMA
R/A
DA
CL
DOBM
OUTL
OUTR
DIGITAL OUT
LM833
LM833
KILL
LEFT
KILL
RIGHT
LEFT
RIGHT
SL
SW
SIDA
SICL
SILD
NRST
STAND BY
STAD
MC68HC05C8
SERVOμP
QRA
QDA
QCL
KILL1
SW
TRAY
4MHz
HM
TURNTABLE MOTOR CONTROL
MOTOR DRIVE
26 x
TMP47CK20F
μP DRIVER
DISPLAY
8
TRAY MOTOR
TRAY SWITCH
CONTROL - DISPLAY (FRONT BOARD)
LOADING ASSY

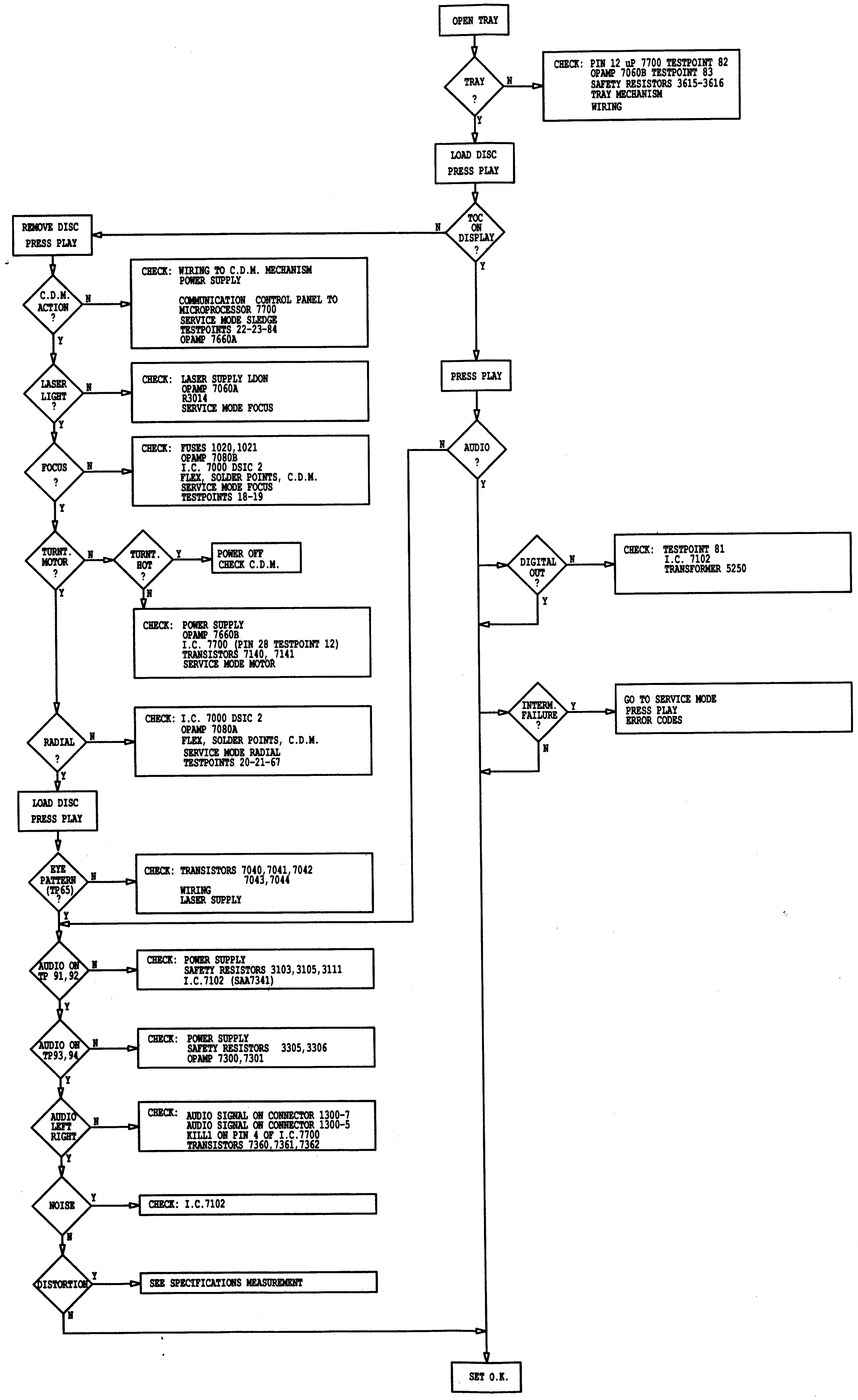
HAS1079
9216

START-UP PROCEDURE


POWER ON
SLEDGE INSIDE ?
N
CHECK SL SL OUT
Y
LASERLIGHT
N
CHECK LDON
Y
FOCUSSING
N
CHECK FO FOC+ FOC-
Y
DISC ROTATION OK?
N
CHECK PWMA HM
Y
TRACK FOLLOWING
N
CHECK OTD RA RAD+ RAD-
Y
PLAY KEY ACTUATED
JUMP TO TRACK 1
N
CHECK HF HFI QRA QDA QCL
Y
START UP PROCEDURE OK

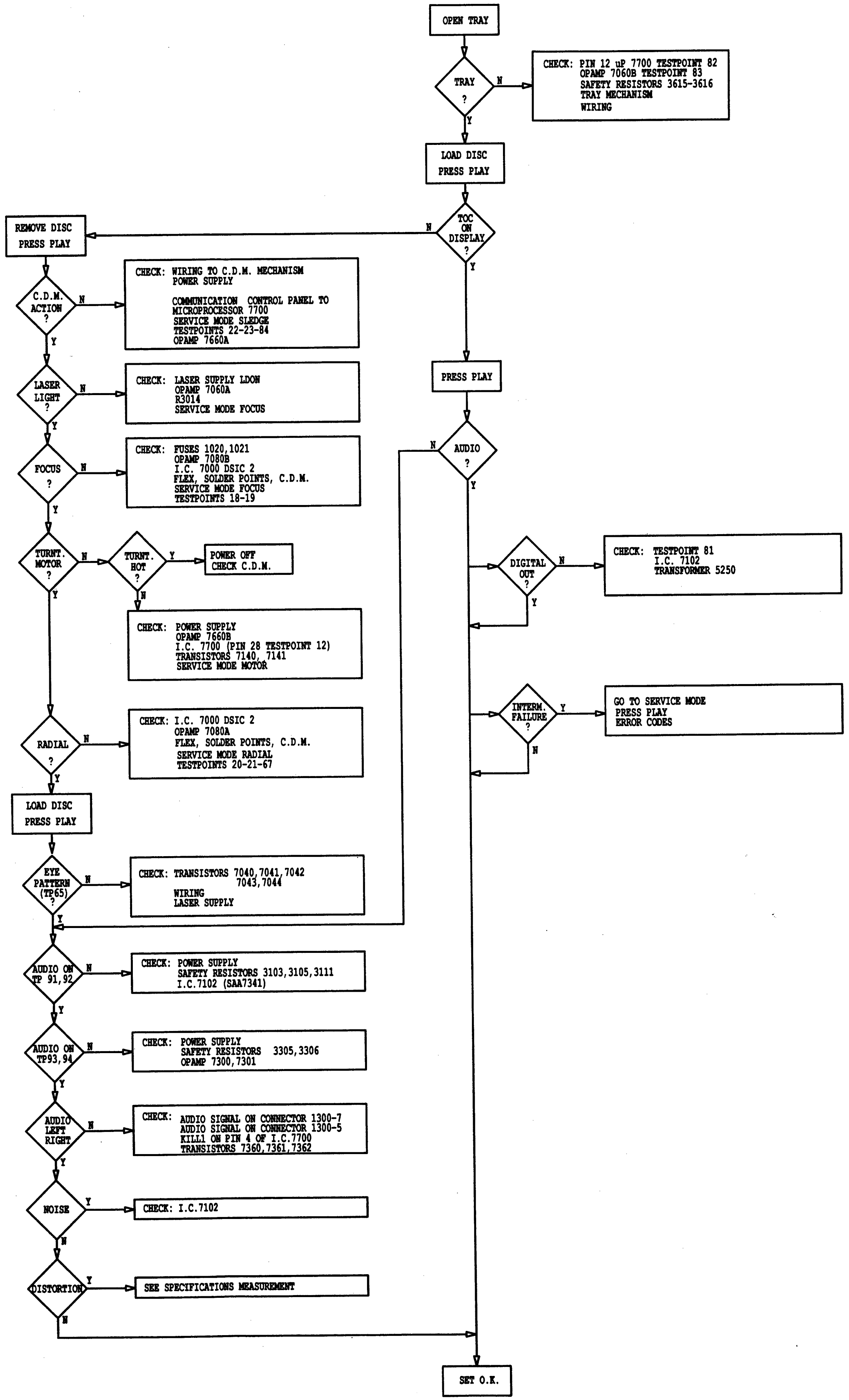
HAS1027
9214

FAULTFINDING TREE


OPEN TRAY
TRAY ?
N
CHECK: PIN 12 uP 7700 TESTPOINT 82
OPAMP 7060B TESTPOINT 83
SAFETY RESISTORS 3615-3616
TRAY MECHANISM
WIRING
Y
LOAD DISC PRESS PLAY
TOC ON DISPLAY ?
N
REMOVE DISC PRESS PLAY
C.D.M. ACTION ?
N
CHECK: WIRING TO C.D.M. MECHANISM
POWER SUPPLY
COMMUNICATION CONTROL PANEL TO
MICROPROCESSOR 7700
SERVICE MODE SLEDGE
TESTPOINTS 22-23-84
OPAMP 7660A
Y
LASER LIGHT ?
N
CHECK: LASER SUPPLY LDON
OPAMP 7060A
R3014
SERVICE MODE FOCUS
Y
FOCUS ?
N
CHECK: FUSES 1020,1021
OPAMP 7080B
I.C. 7000 DSIC 2
FLEX, SOLDER POINTS, C.D.M.
SERVICE MODE FOCUS
TESTPOINTS 18-19
Y
TURNT. MOTOR ?
N
TURNT. HOT ?
Y
POWER OFF CHECK C.D.M.
N
CHECK: POWER SUPPLY
OPAMP 7660B
I.C. 7700 (PIN 28 TESTPOINT 12)
TRANSISTORS 7140, 7141
SERVICE MODE MOTOR
Y
RADIAL ?
N
CHECK: I.C. 7000 DSIC 2
OPAMP 7080A
FLEX, SOLDER POINTS, C.D.M.
SERVICE MODE RADIAL
TESTPOINTS 20-21-67
Y
LOAD DISC PRESS PLAY
EYE PATTERN (TP65) ?
N
CHECK: TRANSISTORS 7040,7041,7042
7043,7044
WIRING
LASER SUPPLY
Y
AUDIO ON TP 91,92
N
CHECK: POWER SUPPLY
SAFETY RESISTORS 3103,3105,3111
I.C.7102 (SAA7341)
Y
AUDIO ON TP93,94
N
CHECK: POWER SUPPLY
SAFETY RESISTORS 3305,3306
OPAMP 7300,7301
Y
AUDIO LEFT RIGHT
N
CHECK: AUDIO SIGNAL ON CONNECTOR 1300-7
AUDIO SIGNAL ON CONNECTOR 1300-5
KILL1 ON PIN 4 OF I.C.7700
TRANSISTORS 7360,7361,7362
Y
NOISE
Y
CHECK: I.C.7102
N
DISTORTION
Y
SEE SPECIFICATIONS MEASUREMENT
N
Y
PRESS PLAY
AUDIO ?
N
Y
DIGITAL OUT ?
N
CHECK: TESTPOINT 81
I.C. 7102
TRANSFORMER 5250
Y
INTERM. FAILURE ?
Y
GO TO SERVICE MODE
PRESS PLAY
ERROR CODES
N
SET O.K.

HAS1081
9218

FAULTFINDING TREE


OPEN TRAY
TRAY ?
N
CHECK: PIN 12 uP 7700 TESTPOINT 82
OPAMP 7060B TESTPOINT 83
SAFETY RESISTORS 3615-3616
TRAY MECHANISM
WIRING
Y
LOAD DISC
PRESS PLAY
TOC ON DISPLAY ?
N
REMOVE DISC
PRESS PLAY
C.D.M. ACTION ?
N
CHECK: WIRING TO C.D.M. MECHANISM
POWER SUPPLY
COMMUNICATION CONTROL PANEL TO
MICROPROCESSOR 7700
SERVICE MODE SLEDGE
TESTPOINTS 22-23-84
OPAMP 7660A
Y
LASER LIGHT ?
N
CHECK: LASER SUPPLY LDON
OPAMP 7060A
R3014
SERVICE MODE FOCUS
Y
FOCUS ?
N
CHECK: FUSES 1020,1021
OPAMP 7080B
I.C. 7000 DSIC 2
FLEX, SOLDER POINTS, C.D.M.
SERVICE MODE FOCUS
TESTPOINTS 18-19
Y
TURNT. MOTOR ?
N
TURNT. HOT ?
Y
POWER OFF
CHECK C.D.M.
N
CHECK: POWER SUPPLY
OPAMP 7660B
I.C. 7700 (PIN 28 TESTPOINT 12)
TRANSISTORS 7140, 7141
SERVICE MODE MOTOR
Y
RADIAL ?
N
CHECK: I.C. 7000 DSIC 2
OPAMP 7080A
FLEX, SOLDER POINTS, C.D.M.
SERVICE MODE RADIAL
TESTPOINTS 20-21-67
Y
LOAD DISC
PRESS PLAY
EYE PATTERN (TP65) ?
N
CHECK: TRANSISTORS 7040,7041,7042
7043,7044
WIRING
LASER SUPPLY
Y
AUDIO ON TP 91,92
N
CHECK: POWER SUPPLY
SAFETY RESISTORS 3103,3105,3111
I.C.7102 (SAA7341)
Y
AUDIO ON TP93,94
N
CHECK: POWER SUPPLY
SAFETY RESISTORS 3305,3306
OPAMP 7300,7301
Y
AUDIO LEFT RIGHT
N
CHECK: AUDIO SIGNAL ON CONNECTOR 1300-7
AUDIO SIGNAL ON CONNECTOR 1300-5
KILL1 ON PIN 4 OF I.C.7700
TRANSISTORS 7360,7361,7362
Y
NOISE
Y
CHECK: I.C.7102
N
DISTORTION
Y
SEE SPECIFICATIONS MEASUREMENT
N
Y
PRESS PLAY
AUDIO ?
N
Y
DIGITAL OUT ?
N
CHECK: TESTPOINT 81
I.C. 7102
TRANSFORMER 5250
Y
INTERM. FAILURE ?
Y
GO TO SERVICE MODE
PRESS PLAY
ERROR CODES
N
SET O.K.

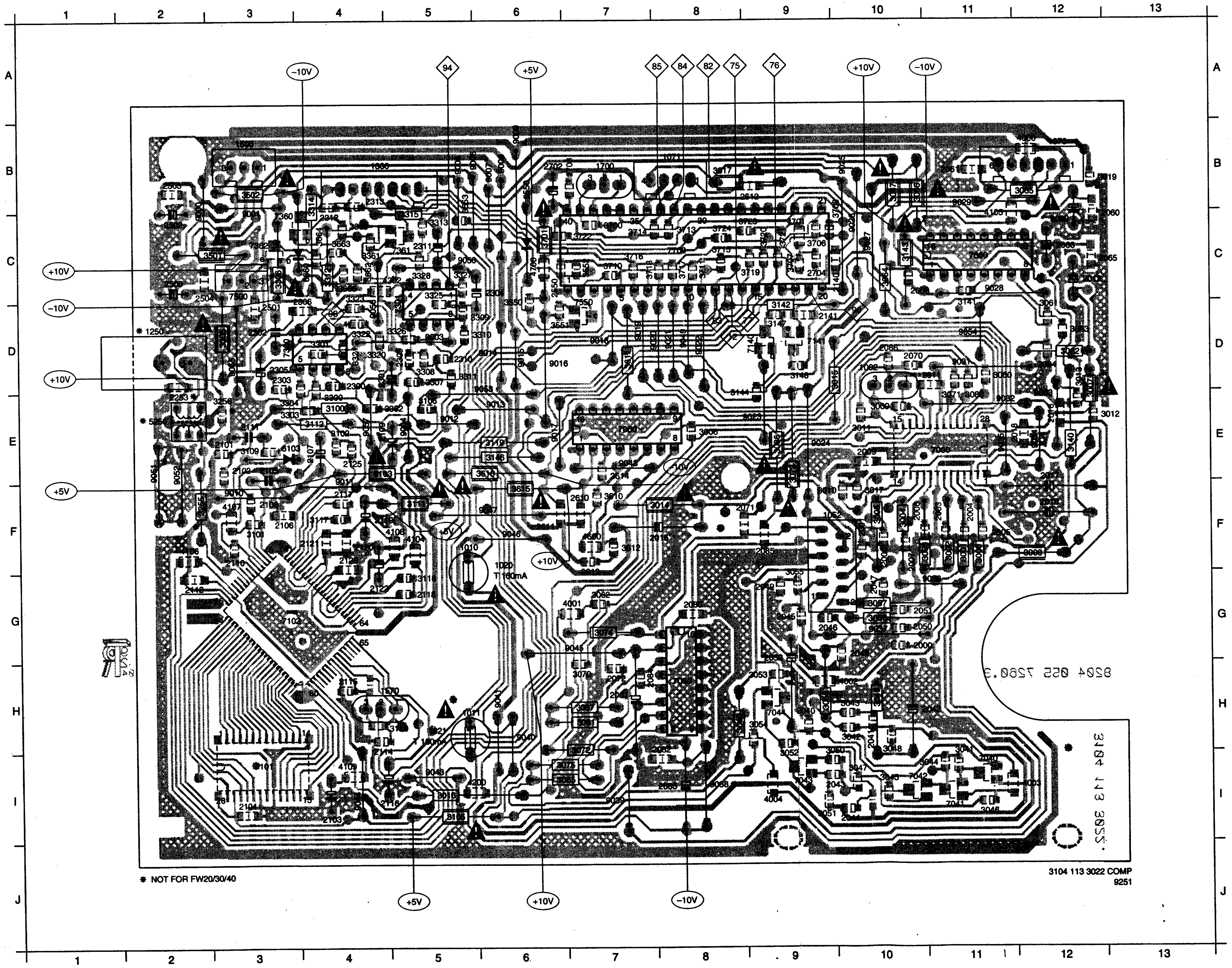
ABBREVIATIONS

A0-A12	: Address outputs to external RAM
AM*	: Additional mute
CFB	: Data slicer feedback output to capacitor
CL	: Microprocessor interface clock input
CLO	: Clock output
D0-D7	: Data inputs/outputs to external RAM
D1-D4	: Central diode signal input
DA	: Microprocessor interface data input/output line
DE1L	: Pin 1 for external de-emphasis capacitor and resistor
DE1R	: Pin 1 for external de-emphasis capacitor and resistor
DE2L	: Pin 2 for external de-emphasis capacitor and resistor
DE2R	: Pin 2 for external de-emphasis capacitor and resistor
DEEM	: Output for external de-emphasis switches
DOBM	: Digital audio output
FO	: Focus actuator output
HFD	: High frequency detector
HFI*	: Inverting data slicer input
HFI	: Non-inverting data slicer input
HM	: Motor control signal
IREF	: Current reference output
KO*	: Kill out
KTC	: Kill time capacitor connection
LDON	: Laser drive on
MACC	: Motor accelerate signal
MBRA	: Motor brake signal
MHAL	: Hall effect detector for motor
NRST	: Reset input
OC	: VCO control
OTD	: Off track detector
OUTL	: Left channel output
OUTR	: Right channel output
PD	: Phase detector
PWMA	: Pulse width modulated motor control acceleration
PWMB	: Pulse width modulated motor brake signal
R/A	: Request/acknowledge
SD1-5	: Photodiode signals
SICL	: Serial interface clock
SIDA	: Serial interface data
SILD	: Serial interface load
SL	: Sledge output
ST*	: Standby mode
TS1-TS2	: Test input
VddA	: Power supply analog part
VddD	: Power supply digital part
VRH	: Reference input for A/D converter
VRL	: Reference input for A/D converter
VssA	: Ground analog part
VssD	: Ground digital part
WE	: Write enable
XIN	: Crystal oscillator input
XOUT	: Output to clock crystal
XTLI	: Oscillator input
XTLO	: Oscillator output
XTLR	: Oscillator reference

* log. 0-active !

CD COMPONENT AND CHIP LAYOUT

1002	D10	2008	F10	2050	G10	2101	E3	2122	G4	2502	C2	3010	F9	3052	I9	3075	I6	3140	E12	3310	D5	3552	C7	3711	C8	4106	F2	7080	H8	9007	B6	9027	C10	9049	D8
1010	F5	2009	E10	2051	G10	2102	E3	2123	F4	2503	B2	3011	E10	3053	H9	3080	E11	3141	D11	3311	D5	3553	C5	3713	C8	4107	F3	7101	I3	9008	B6	9028	C11	9050	C5
1011	H5	2010	F12	2052	G9	2103	I4	2125	E4	2504	C2	3012	E12	3054	H9	3081	H7	3142	D9	3312	C4	3610	F7	3714	C7	4108	F4	7102	G3	9009	B6	9029	B11	9051	E2
1020	F6	2011	D10	2060	C12	2104	I3	2140	C10	2550	C6	3013	D12	3055	G9	3082	G7	3143	C10	3313	C5	3611	D7	3715	C8	4109	I4	7140	D9	9010	F3	9031	D11	9052	E2
1021	H5	2012	C12	2061	B11	2105	E3	2141	D9	2610	F7	3014	F7	3056	G10	3085	I6	3144	E8	3314	C4	3612	F7	3716	C7	4200	I5	7141	D9	9011	F4	9032	E11	9053	D5
1052	F9	2015	F7	2062	C12	2106	F3	2253	E2	2611	F6	3015	D10	3057	G10	3086	E9	3146	E6	3315	C5	3613	G7	3717	C8	4302	C4	7300	D3	9012	E5	9033	E12	9054	D11
1070	B12	2016	E12	2063	C12	2107	E4	2300	D4	2612	B8	3016	I5	3058	H9	3087	H7	3147	D9	3320	D4	3614	E7	3718	C7	4600	F7	7301	D5	9013	E6	9034	E12	9055	D3
1071	B8	2017	E12	2064	D12	2108	F3	2301	D4	2702	B6	3017	F10	3060	D11	3100	E4	3148	D9	3321	D4	3615	F6	3719	C8	4700	C6	7360	C3	9014	D6	9035	E11	9056	D4
1250	D2	2018	E12	2065	C12	2109	E4	2302	D3	2703	B7	3040	H8	3061	D12	3101	F3	3255	F2	3322	D4	3616	E6	3720	C9	4701	C9	7361	C5	9015	D6	9036	G10	9057	E4
1300	B4	2019	B12	2066	C10	2110	F3	2303	D3	2704	C9	3041	I11	3062	D12	3102	E4	3256	E3	3323	C4	3617	B8	3721	C9	5250	E2	7362	C3	9016	D6	9037	G10		
1500	B3	2040	H9	2070	D10	2111	E3	2304	C6	3000	F11	3042	H10	3063	D12	3103	E4	3300	E4	3325	C5	3662	C4	3722	C7	6103	E3	7500	C3	9017	E6	9038	I8		
1570	H4	2041	H10	2071	F8	2112	G2	2305	D3	3001	F11	3043	H10	3064	C10	3105	I5	3301	D4	3326	D5	3663	C4	3723	C8	6550	B6	7550	D7	9018	D7	9039	I7		
1700	B7	2042	H10	2072	H7	2114	I4	2306	D3	3002	F11	3044	I10	3065	B12	3106	E5	3302	E4	3327	C5	3664	C4	3724	C8	6660	C4	7660	C11	9019	D7	9040	H6		
2000	G10	2043	I9	2080	G8	2115	H4	2309	D5	3003	F11	3045	I10	3066	B10	3109	E3	3303	E3	3328	C5	3665	C4	4000	B12	7000	E11	7700	C8	9020	D8	9041	H6		
2001	F10	2044	I10	2081	H7	2116	I4	2310	D5	3004	F10	3046	I11	3067	B10	3110	H5	3304	E3	3360	C4	3700	C7	4001	G6	7040	I11	9000	C2	9021	D8	9043	I5		
2003	F11	2045	G9	2082	I7	2117	F4	2311	C5	3005	F10	3047	I10	3070	H7	3111	F5	3305	D3	3361	C4	3701	C6	4002	H10	7041	I11	9001	C3	9022	D8	9044	I4		
2004	F11	2046	G9	2083	I8	2118	G5	2312	C4	3006	E8	3048	I10	3071	E11	3112	E4	3306	C3	3501	C2	3706	C9	4003	I12	7042	I10	9003	D5	9023	E8	9045	G6		
2005	F11	2047	G10	2084	H7	2119	F4	2313	B4	3007	E12	3049	H10	3072	I7	3117	F4	3307	D5	3502	B3	3707	C9	4004	I9	7043	I9	9004	E5	9024	E9	9046	F6		
2007	G10	2048	G10	2085	F9	2120	F4	2500	C2	3008	F12	3050	I9	3073	F9	3118	G5	3308	D5	3550	D6	3708	C10	4104	F5	7044	H9	9005	B5	9025	B10	9047	F6		
2008	F10	2049	G9	2086	D10	2121	F4	2501	D3	3009	E10	3051	I9	3074	G7	3119	E6	3309	D5	3551	D6	3710	C7	4105	C11	7060	E7	9006	B6	9026	C10	9048	E7		



* NOT FOR FW20/30/40

3104 113 3022 COMP
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1002	E4	2007	G4	2046	G5	2081	H7	2114	I10	2304	D9	2703	B8	3016	I9	3056	G4	3081	H8	3140
1010	F9	2008	F4	2047	G5	2082	I7	2115	H10	2305	D11	2704	C5	3017	F4	3057	G4	3082	G7	3141
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1020	G9	2009	E5	2049	G6	2084	H7	2117	F10	2309	D10	3001	G4	3041	I3	3060	E3	3086	E6	3143
1021	I9	2010	F2	2050	G4	2085	G6	2118	G9	2310	D9	3002	G4	3042	I5	3061	D2	3087	H8	3144
1052	F5	2011	E4	2051	G4	2086	D4	2119	F10	2311	C9	3003	G4	3043	H5	3062	D2	3100	E10	3146
1070	B2	2012	C2	2052	H6	2101	E12	2120	F10	2312	C10	3004	F4	3044	I4	3063	D2	3101	F11	3147
1071	B7	2015	F7	2060	C2	2102	F11	2121	F11	2313	C10	3005	F5	3045	I4	3064	D4	3102	E10	3148
1250	D12	2016	E3	2061	B4	2103	I11	2122	G10	2500	D12	3006	E6	3046	I3	3065	C3	3103	F10	3255
1300	B10	2017	F2	2062	C2	2104	I11	2123	G10	2501	D11	3007	E2	3047	I5	3066	C4	3105	I9	3256
1500	B11	2018	E3	2063	C2	2105	F11	2125	F10	2502	C12	3008	G3	3048	I4	3067	C4	3106	E9	3300
1570	H10	2019	B2	2064	D2	2106	F11	2140	D5	2503	B12	3009	E4	3049	H5	3070	H8	3109	E11	3301
1700	B7	2040	H5	2065	C2	2107	E11	2141	D5	2504	D12	3010	F5	3050	I5	3071	E4	3110	H10	3302
2000	H4	2041	I5	2066	D4	2108	F11	2253	E12	2550	D8	3011	E5	3051	I5	3072	I8	3111	F10	3303
2001	F5	2042	H4	2070	D4	2109	E10	2300	E10	2610	F8	3012	E2	3052	I5	3073	F5	3112	E11	3304
2003	F4	2043	I5	2071	F6	2110	G12	2301	E10	2611	F8	3013	E2	3053	H6	3074	G7	3117	F11	3305
2004	F3	2044	J5	2072	H7	2111	E11	2302	D11	2612	C6	3014	F7	3054	H6	3075	I8	3118	G9	3306
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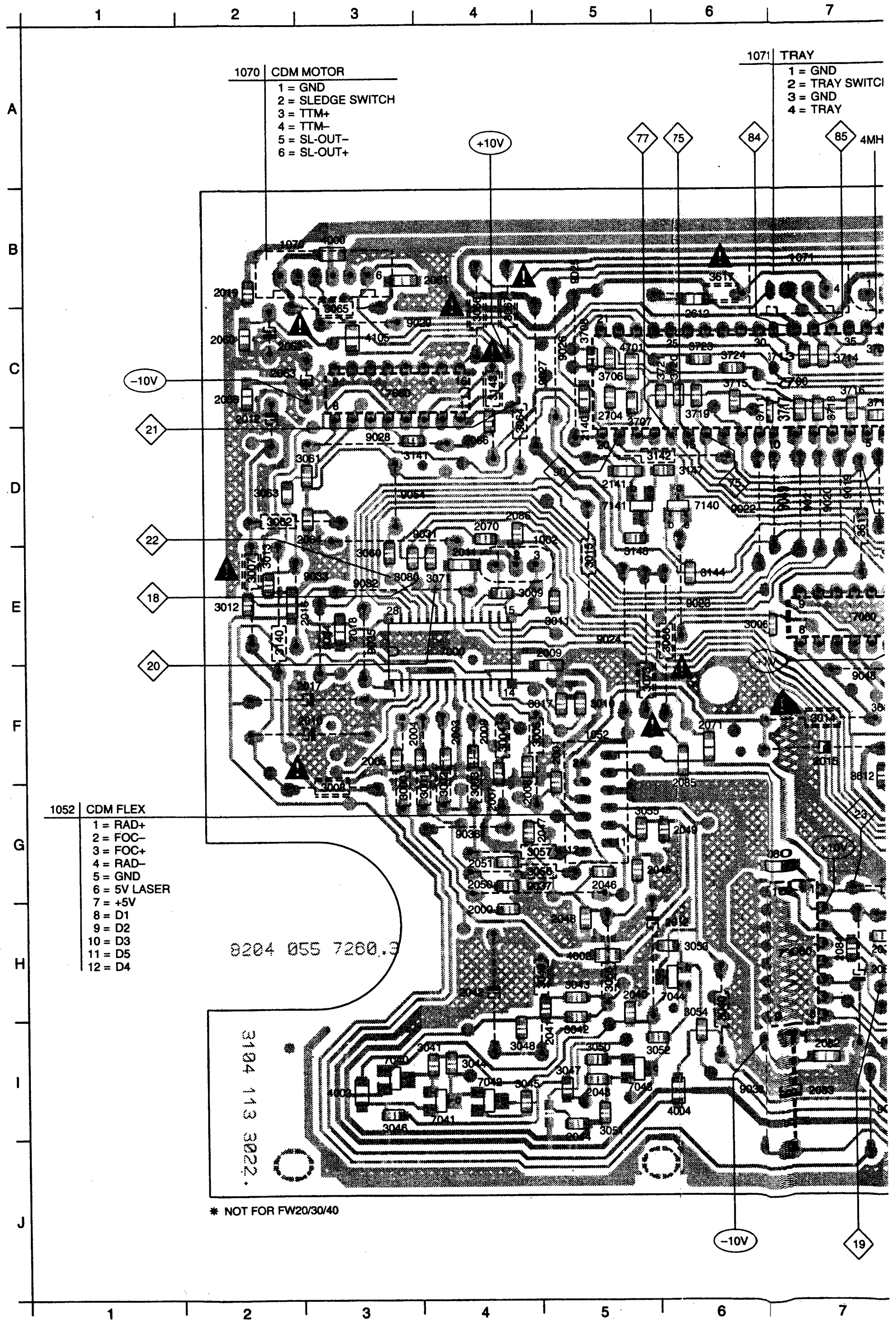
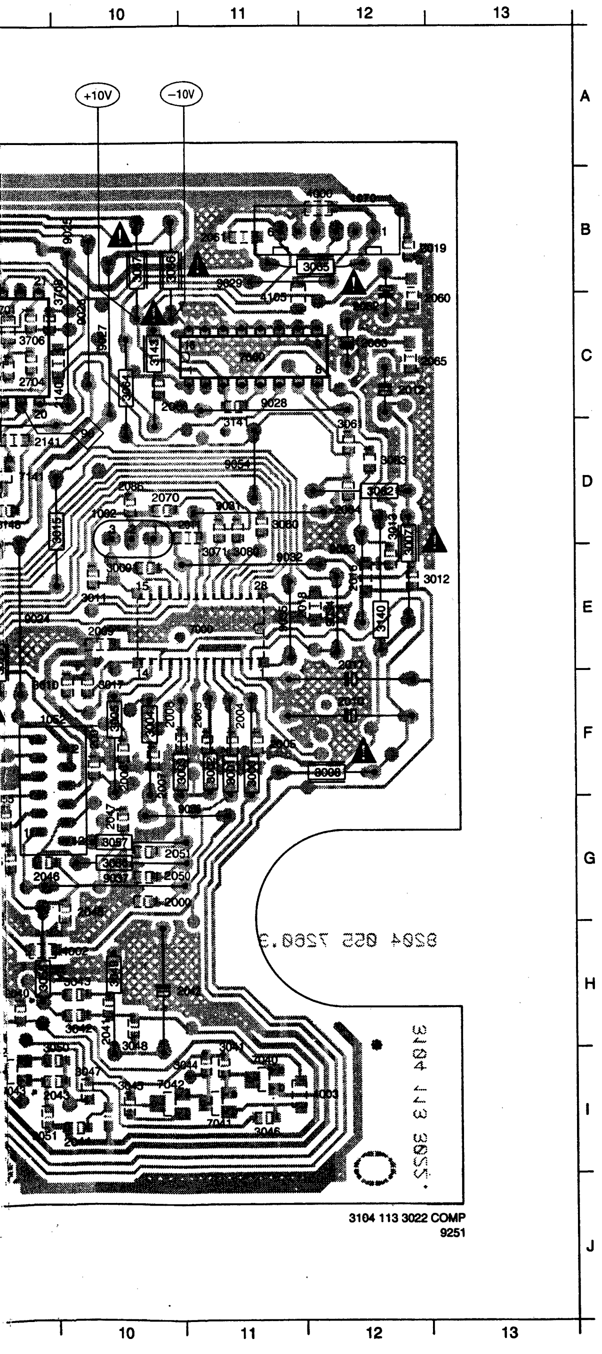


* NOT FOR FW20/30/40

C8	4106	F2	7080	H8	9007	B6	9027	C10	9049	D8
C8	4107	F3	7101	I3	9008	B6	9028	C11	9050	C5
C7	4108	F4	7102	G3	9009	B6	9029	B11	9051	E2
C8	4109	I4	7140	D9	9010	F3	9031	D11	9052	E2
C7	4200	I5	7141	D9	9011	F4	9032	E11	9053	D5
C8	4302	C4	7300	D3	9012	E5	9033	E12	9054	D11
C7	4600	F7	7301	D5	9013	E6	9034	E12	9055	D3
C8	4700	C6	7360	C3	9014	D6	9035	E11	9056	D4
C9	4701	C9	7361	C5	9015	D6	9036	G10	9057	E4
C9	5250	E2	7362	C3	9016	D6	9037	G10		
C7	6103	E3	7500	C3	9017	E6	9038	I8		
C8	6550	B6	7550	D7	9018	D7	9039	I7		
C8	6660	C4	7660	C11	9019	D7	9040	H6		
B12	7000	E11	7700	C8	9020	D8	9041	H6		
G6	7040	I11	9000	C2	9021	D8	9043	I5		
H10	7041	I11	9001	C3	9022	D8	9044	I4		
I12	7042	I10	9003	D5	9023	E8	9045	G6		
I9	7043	I9	9004	E5	9024	E9	9046	F6		
F5	7044	H9	9005	B5	9025	B10	9047	F6		
C11	7060	E7	9006	B6	9026	C10	9048	E7		


10
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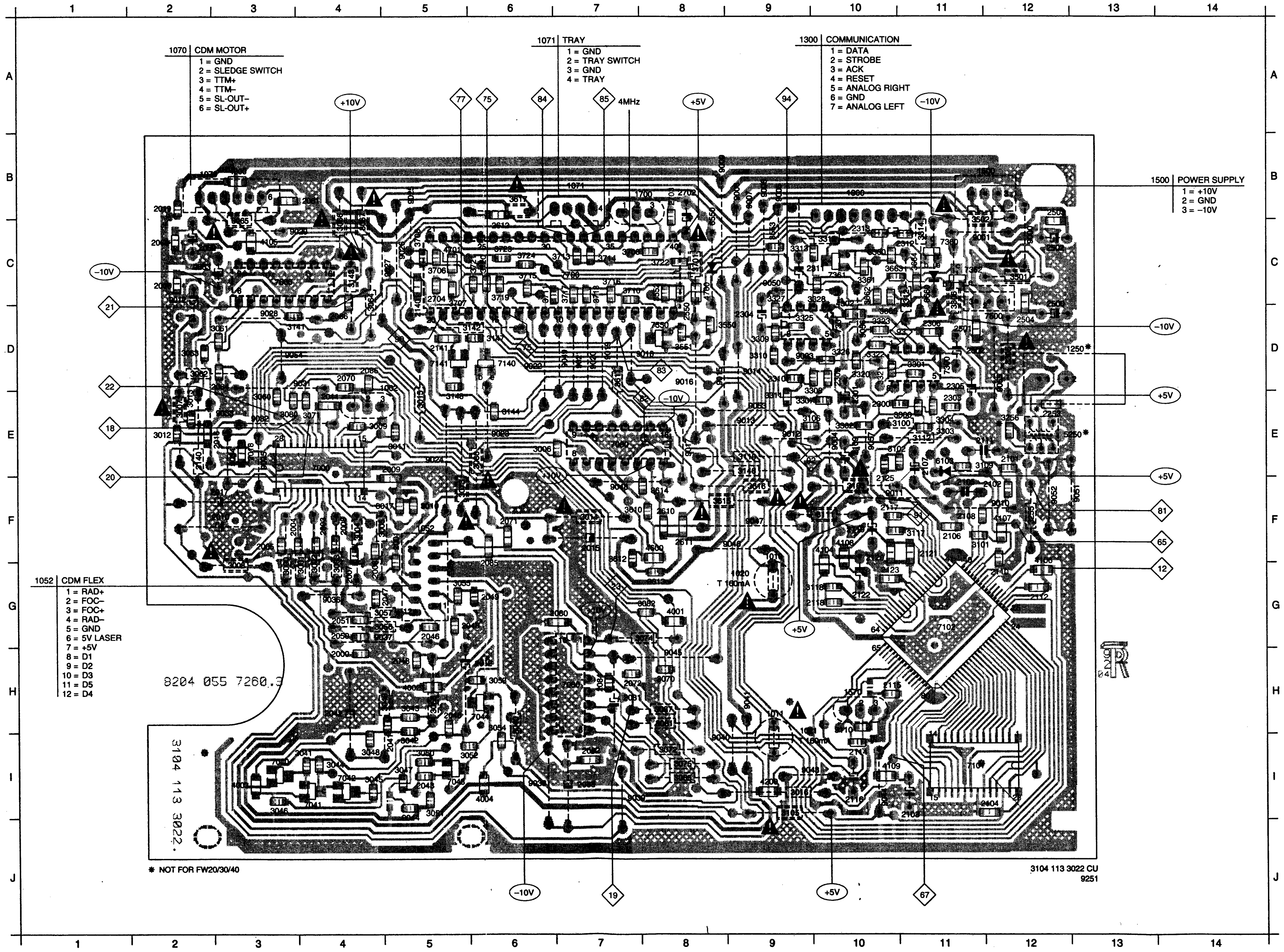
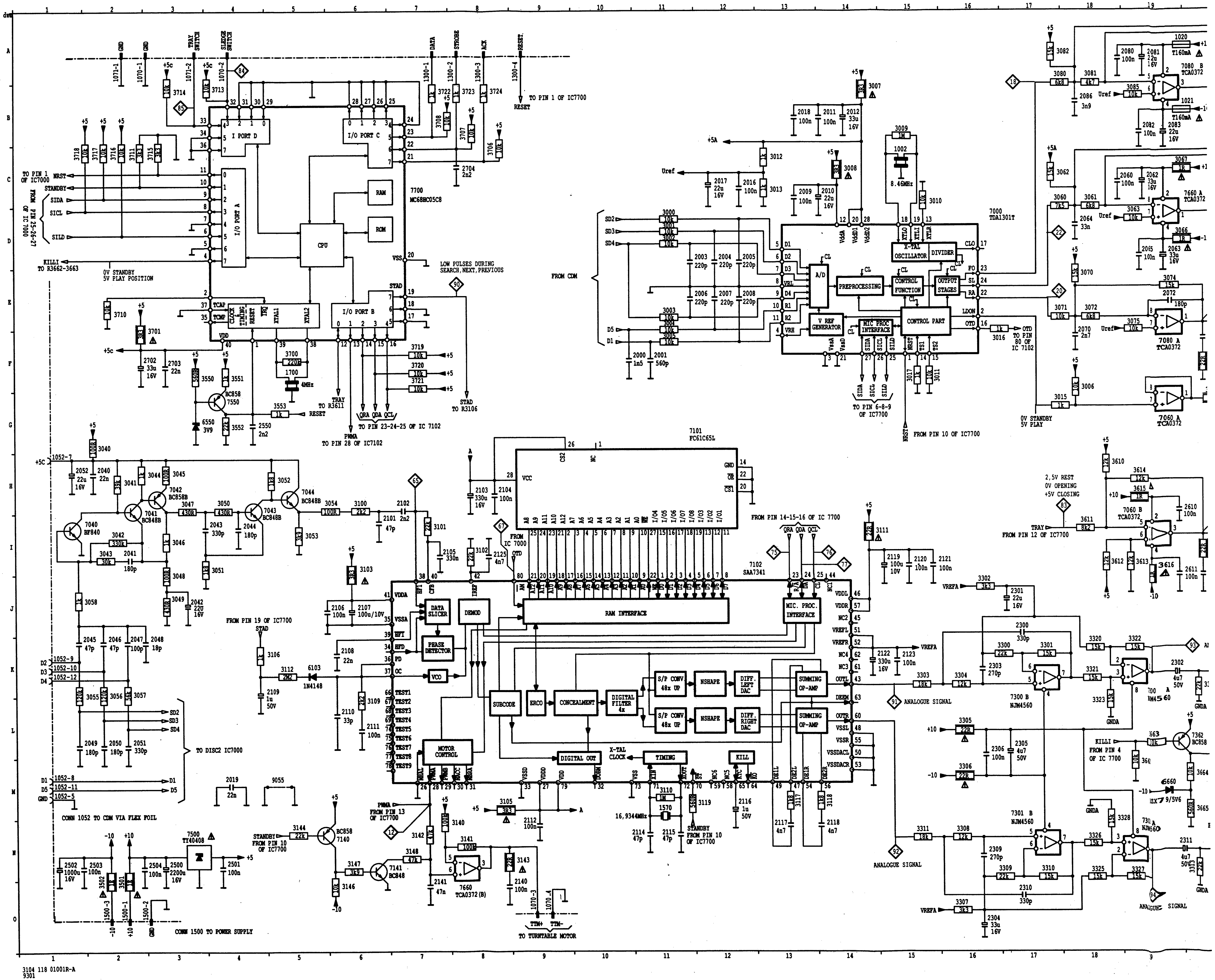
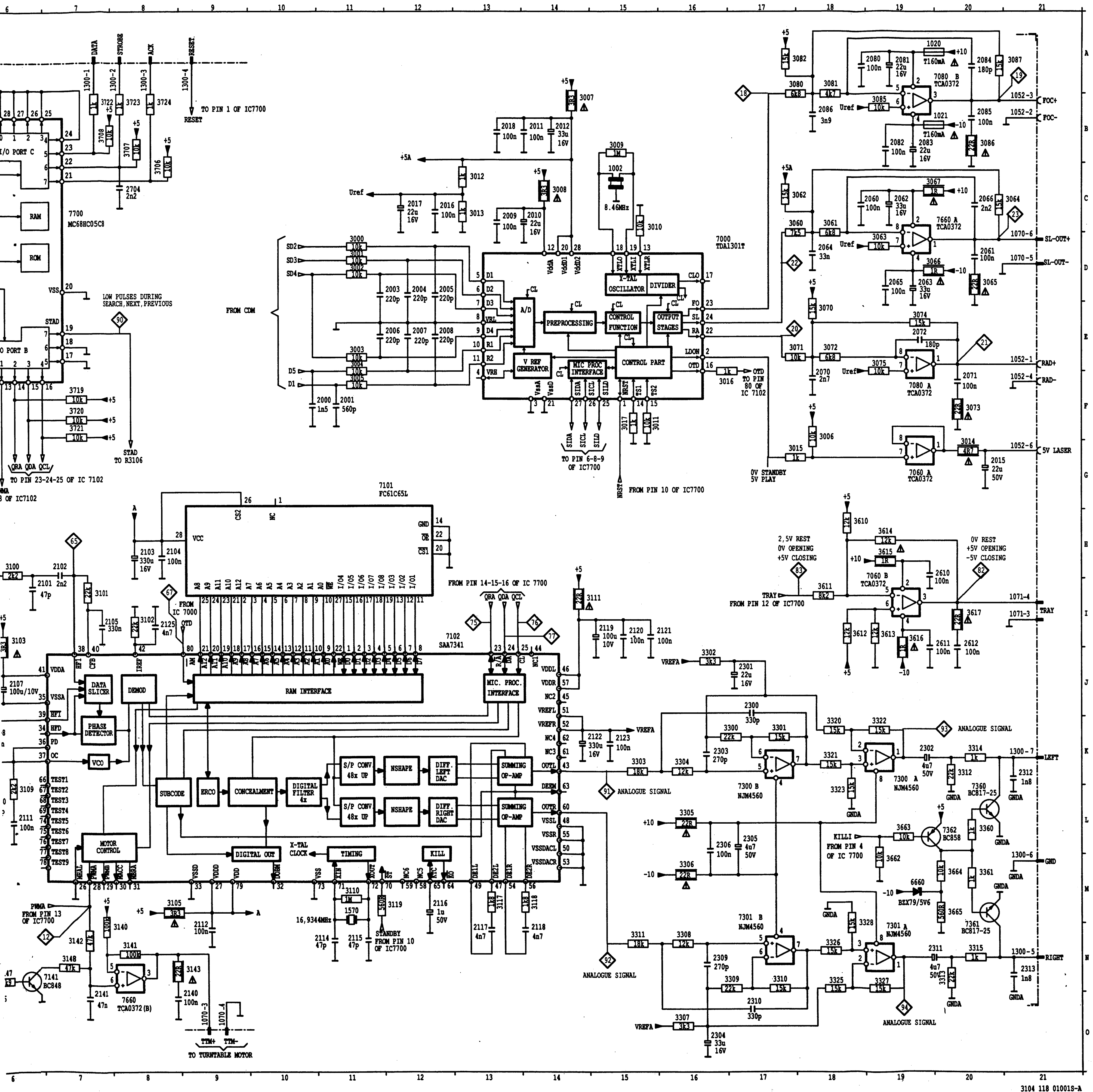
3104 113 3022 COMP
9251

1002	E4	2007	G4	2046	G5	2081	H7	2114	I10	2304	D9	2703	B8	3016	I9	3056	G4	3081	H8	3140	E2	3308	E9	3501	C12	3700	C7	3724	C6	6103	E11	7361	C10	9013	E9	9032	E3	9051	F13
1010	F9	2008	F4	2047	G5	2082	I7	2115	H10	2305	D11	2704	C5	3017	F4	3057	G4	3082	G7	3141	D3	3309	D9	3502	C11	3701	C8	4000	B3	6550	C8	7362	C11	9014	D9	9033	E3	9052	F12
1011	H9	2008	G4	2048	H5	2083	I7	2116	I10	2306	D11	3000	G3	3040	I6	3058	H5	3085	I8	3142	D5	3310	D9	3550	D8	3706	C5	4001	G8	6660	C11	7500	D12	9015	D8	9034	E3	9053	E9
1020	G9	2009	E5	2049	G6	2084	H7	2117	F10	2309	D10	3001	G4	3041	I3	3060	E3	3086	E6	3143	C4	3311	E9	3551	D8	3707	D5	4002	H5	7000	E4	7550	D8	9016	D8	9035	E3	9054	D3
1021	I9	2010	F2	2050	G4	2085	G6	2118	G9	2310	D9	3002	G4	3042	I5	3061	D2	3087	H8	3144	E6	3312	D11	3552	C8	3708	C5	4003	I3	7040	I3	7660	C3	9017	E8	9036	G4	9055	E12
1052	F5	2011	E4	2051	G4	2086	D4	2119	F10	2311	C9	3003	G4	3043	H5	3062	D2	3100	E10	3146	E9	3313	C9	3553	C9	3710	C7	4004	I6	7041	I4	7700	C7	9018	D7	9037	G4	9056	D10
1070	B2	2012	C2	2052	H6	2101	E12	2120	F10	2312	C10	3004	F4	3044	I4	3063	D2	3101	F11	3147	D6	3314	C11	3610	F7	3711	C6	4104	F10	7042	I4	9000	C12	9019	D7	9038	I6	9057	E10
1071	B7	2015	F7	2060	C2	2102	F11	2121	F11	2313	C10	3005	F5	3045	I4	3064	D4	3102	E10	3148	E5	3315	C10	3611	D7	3713	C6	4105	C3	7043	I5	9001	C11	9020	D7	9039	I7		
1250	D12	2016	E3	2061	B4	2103	I11	2122	G10	2500	D12	3006	E6	3046	I3	3065	C3	3103	F10	3255	F12	3320	D10	3612	F7	3714	C7	4106	F12	7044	H6	9003	D9	9021	D7	9040	I8		
1300	B10	2017	F2	2062	C2	2104	I11	2123	G10	2501	D11	3007	E2	3047	I5	3066	C4	3105	I9	3256	E12	3321	D10	3613	G8	3715	C6	4107	F12	7060	E7	9004	E10	9022	D6	9041	H9		
1500	B11	2018	E3	2063	C2	2105	F11	2125	F10	2502	C12	3008	G3	3048	I4	3067	C4	3106	E9	3300	E10	3322	D10	3614	F8	3716	C7	4108	F10	7080	H7	9005	B9	9023	E6	9043	I9		
1570	H10	2019	B2	2064	D2	2106	F11	2140	D5	2503	B12	3009	E4	3049	H5	3070	H8	3109	E11	3301	D11	3323	D10	3615	F8	3717	C7	4109	I10	7101	I11	9006	B9	9024	E5	9044	I10		
1700	B7	2040	H5	2065	C2	2107	E11	2141	D5	2504	D12	3010	F5	3050	I5	3071	E4	3110	H10	3302	E10	3325	D9	3616	F9	3718	C7	4200	I9	7102	G11	9007	B9	9025	B5	9045	H8		
2000	H4	2041	I5	2066	D4	2108	F11	2253	E12	2550	D8	3011	E5	3051	I5	3072	I8	3111	F10	3303	E11	3326	D10	3617	B6	3719	C6	4302	D10	7140	D6	9008	B9	9026	C5	9046	F8		
2001	F5	2042	H4	2070	D4	2109	E10	2300	E10	2610	F8	3012	E2	3052	I5	3073	F5	3112	E11	3304	E11	3327	C9	3662	C10	3720	C6	4600	F8	7141	D5	9009	B8	9027	C5	9047	F9		
2003	F4	2043	I5	2071	F6	2110	G12	2301	E10	2611	F8	3013	E2	3053	H6	3074	G7	3117	F11	3305	D12	3328	C9	3663	C10	3721	C6	4700	C8	7300	D11	9010	F12	9028	D3	9048	F7		
2004	F3	2044	J5	2072	H7	2111	E11	2302	D11	2612	C6	3014	F7	3054	H6	3075	I8	3118	G9	3306	D11	3360	C10	3664	C11	3722	C8	4701	C5	7301	D10	9011	F10	9029	C3	9049	D7		
2005	F3	2045	G5	2080	G6	2112	G12	2303	E11	2702	B8	3015	E5	3055	G5	3080	E3	3119	E9	3307	E9	3361	C10	3665	D10	3723	C6	5250	E12	7360	C11	9012	E9	9031	D3	9050	C9		


1
2
3
4
5
6
7
8
9
10
11
12
13
14
A
B
C
D
E
F
G
H
I
J
1070 CDM MOTOR
1 = GND
2 = SLEDGE SWITCH
3 = TTM+
4 = TTM–
5 = SL-OUT–
6 = SL-OUT+
1071 TRAY
1 = GND
2 = TRAY SWITCH
3 = GND
4 = TRAY
1300 COMMUNICATION
1 = DATA
2 = STROBE
3 = ACK
4 = RESET
5 = ANALOG RIGHT
6 = GND
7 = ANALOG LEFT
1500 POWER SUPPLY
1 = +10V
2 = GND
3 = −10V
1052 CDM FLEX
1 = RAD+
2 = FOC–
3 = FOC+
4 = RAD–
5 = GND
6 = 5V LASER
7 = +5V
8 = D1
9 = D2
10 = D3
11 = D5
12 = D4
+10V
−10V
+5V
4MHz
77
75
84
85
94
21
22
18
20
81
65
12
19
67
1250*
5250*
T 160mA
8204 055 7260.3
3104 113 3022.
* NOT FOR FW20/30/40
3104 113 3022 CU
9251

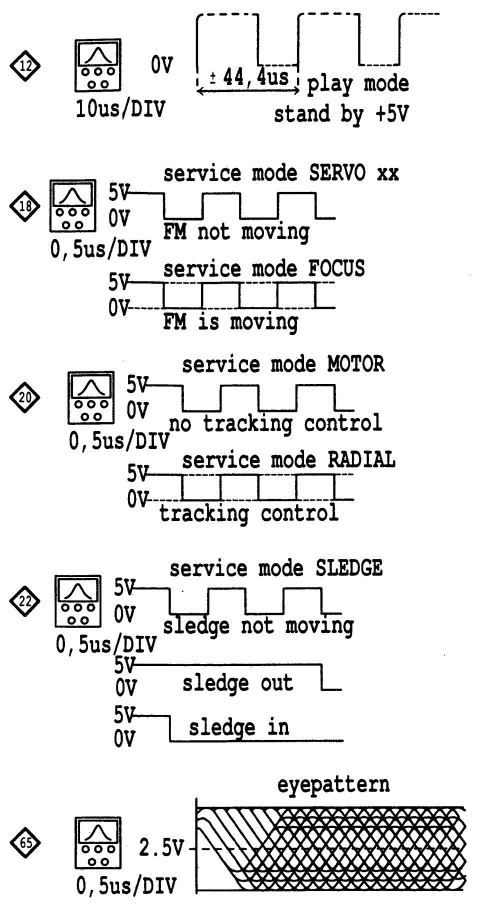
CD CIRCUIT DIAGRAM


GND
TRAY SWITCH
SLEDGE SWITCH
DATA
STROBE
ACK
RESET
TO PIN 1 OF IC7700
I PORT D
I/O PORT C
I/O PORT A
I/O PORT B
CPU
RAM
ROM
7700
MC68HC05C8
TO PIN 1 OF IC7000
NRST
STANDBY
SIDA
SICL
SILD
FROM PIN 21-26-27 OF IC7000
KILLI
TO R3662-3663
0V STANDBY
5V PLAY POSITION
LOW PULSES DURING SEARCH, NEXT, PREVIOUS
STAD
TO R3106
TRAY TO R3611
PWMA TO PIN 28 OF IC7102
QRA QDA QCL
TO PIN 23-24-25 OF IC 7102
4MHz
BC858 7550
6550 3V9
7000
TDA1301T
FROM CDM
SD2
SD3
SD4
D5
D1
A/D
PREPROCESSING
CONTROL FUNCTION
OUTPUT STAGES
X-TAL OSCILLATOR
DIVIDER
V REF GENERATOR
MIC PROC INTERFACE
CONTROL PART
8.46MHz
Uref
+5A
TO PIN 80 OF IC 7102
TO PIN 6-8-9 OF IC7700
NRST FROM PIN 10 OF IC7700
0V STANDBY 5V PLAY
7080 B TCA0372
7080 A TCA0372
7660 A TCA0372
7060 A TCA0372
T160mA
7101
FC61C65L
7102
SAA7341
RAM INTERFACE
DATA SLICER
DEMOD
PHASE DETECTOR
VCO
MOTOR CONTROL
SUBCODE
ERCO
CONCEALMENT
DIGITAL FILTER 4x
S/P CONV 48x UP
NSHAPE
DIFF. LEFT DAC
DIFF. RIGHT DAC
SUMMING OP-AMP
MIC. PROC. INTERFACE
DIGITAL OUT
X-TAL CLOCK
TIMING
KILL
16,9344MHz
STANDBY FROM PIN 10 OF IC7700
FROM PIN 14-15-16 OF IC 7700
FROM PIN 19 OF IC7700 STAD
1N4148
7040 BF840
7041 BC848B
7042 BC858B
7043 BC848B
7044 BC848B
TO DISC2 IC7000
CONN 1052 TO CDM VIA FLEX FOIL
CONN 1500 TO POWER SUPPLY
7500 TY40408
STANDBY FROM PIN 10 OF IC7700
BC858 7140
7141 BC848
PWMA FROM PIN 13 OF IC7700
7660 TCA0372 (B)
TO TURNTABLE MOTOR
TTM+ TTM-
VREFA
ANALOGUE SIGNAL
7300 B NJM4560
7301 B NJM4560
2,5V REST 0V OPENING +5V CLOSING
TRAY FROM PIN 12 OF IC7700
7060 B TCA0372
KILLI FROM PIN 4 OF IC 7700
7362 BC858
9/5V6
GNDA


DATA
STROBE
ACK
RESET
TO PIN 1 OF IC7700
I/O PORT C
RAM
ROM
7700
MC68HC05C8
LOW PULSES DURING SEARCH,NEXT,PREVIOUS
STAD
I/O PORT B
STAD TO R3106
QRA QDA QCL
TO PIN 23-24-25 OF IC 7102
FROM CDM
SD2
SD3
SD4
D5
D1
Uref
+5A
8.46MHz
7000
TDA1301T
A/D
PREPROCESSING
CONTROL FUNCTION
X-TAL OSCILLATOR
DIVIDER
OUTPUT STAGES
CONTROL PART
V REF GENERATOR
MIC PROC INTERFACE
TO PIN 6-8-9 OF IC7700
FROM PIN 10 OF IC7700
OTD TO PIN 80 OF IC 7102
0V STANDBY
5V PLAY
7080 B TCA0372
7080 A TCA0372
7660 A TCA0372
7060 A TCA0372
7060 B TCA0372
FOC+
FOC-
SL-OUT+
SL-OUT-
RAD+
RAD-
5V LASER
2,5V REST
0V OPENING
+5V CLOSING
0V REST
+5V OPENING
-5V CLOSING
TRAY
FROM PIN 12 OF IC7700
7101
FC61C65L
FROM PIN 14-15-16 OF IC 7700
FROM IC 7000
7102
SAA7341
DATA SLICER
DEMOD
PHASE DETECTOR
VCO
RAM INTERFACE
MIC. PROC. INTERFACE
S/P CONV 48x UP
NSHAPE
DIFF. LEFT DAC
DIFF. RIGHT DAC
SUMMING OP-AMP
SUBCODE
ERCO
CONCEALMENT
DIGITAL FILTER 4x
DIGITAL OUT
X-TAL CLOCK
TIMING
KILL
MOTOR CONTROL
16,9344MHz
STANDBY FROM PIN 10 OF IC 7700
PWMA FROM PIN 13 OF IC7700
7141 BC848
7660 TCA0372 (B)
TTM+ TTM-
TO TURNTABLE MOTOR
VREFA
ANALOGUE SIGNAL
7300 B NJM4560
7300 A NJM4560
7301 B NJM4560
7301 A NJM4560
7360 BC817-25
7361 BC817-25
7362 BC858
KILLI FROM PIN 4 OF IC 7700
BZX79/5V6
LEFT
RIGHT
GND
GNDA

3104 118 01001S-A
9301

1002	C15
1020	A20
1021	B20
1052	K 1
1052	K 1
1052	M 1
1052	M 1
1052	K 1
1052	M 1
1052	H 1
1052	B21
1052	G21
1052	F21
1052	E21
1052	B21
1070	O 9
1070	O 9
1070	A 4
1070	A 2
1070	D21
1070	D21
1071	A 3
1071	A 2
1071	I21
1071	I21
1300	A 9
1300	A 8
1300	A 8
1300	A 7
1300	K21
1300	N21
1300	M21
1500	O 2
1500	O 2
1500	O 2
1570	M11
1700	F 5
2000	F11
2001	F11
2003	D12
2004	D12
2005	D12
2006	E12
2007	E12
2008	E12
2009	C13
2010	C14
2011	B14
2012	B14
2015	G20
2016	C12
2017	C12
2018	B13
2019	M 4
2040	H 2
2041	I 2
2042	J 3
2043	I 4
2044	I 4
2045	K 1
2046	K 2
2047	K 2
2048	K 3
2049	L 1
2050	L 2
2051	L 2
2052	H 1
2060	C18
2061	D20
2062	C19
2063	D19
2064	D18
2065	D19
2066	C20
2070	F18
2071	F20
2072	E19
2080	A19
2081	A19
2082	B19
2083	B19
2084	A20
2085	B20
2086	B18
2101	I 6
2102	H 7
2103	H 8
2104	H 8
2105	I 7
2106	J 6
2107	J 6
2108	K 6
2109	K 5
2110	L 6
2111	L 6
2112	N 9
2114	N11
2115	N11
2116	M12
2117	N13
2118	N14
2119	I15
2120	I15
2121	I15
2122	K14
2123	K15
2125	I 8
2140	O 9
2141	O 7
2300	J17
2301	J17
2302	K19
2303	K16
2304	O16
2305	L17
2306	L16
2309	N16
2310	O17
2311	N19
2312	K21
2313	N21
2500	N 3
2501	N 4
2502	N 1
2503	N 2
2504	N 3
2550	G 4
2610	H20
2611	I20
2612	I20
2702	F 2
2703	F 3
2704	C 8
3000	D11
3001	D11
3002	D11
3003	E11
3004	E11
3005	F11
3006	F18
3007	B14
3008	C14
3009	B15
3010	C15
3011	F16
3012	C13
3013	C13
3014	G20
3015	G18
3016	F16
3017	F15
3040	G 2
3041	H 2
3042	I 2
3043	I 2
3044	H 3
3045	H 3
3046	I 3
3047	H 3
3048	J 3
3049	J 3
3050	H 4
3051	I 4
3052	H 5
3053	I 5
3054	H 6
3055	L 2
3056	K 2
3057	K 2
3058	J 2
3060	C18
3061	C18
3062	C17
3063	D19
3064	C21
3065	D20
3066	D19
3067	C19
3070	E18
3071	E18
3072	E18
3073	F20
3074	E19
3075	E19
3080	A18
3081	A18
3082	A17
3085	B19
3086	B20
3087	A21
3100	H 6
3101	I 7
3102	I 8
3103	I 6
3105	M 8
3106	K 5
3109	L 6
3110	M11
3111	I14
3112	K 5
3117	M13
3118	M14
3119	M12
3140	N 8
3141	N 8
3142	N 7
3143	N 9
3144	N 5
3146	O 6
3147	N 6
3148	N 7
3300	K16
3301	K17
3302	J16
3303	K15
3304	K16
3305	L16
3306	M16
3307	O16
3308	N16
3309	N16
3310	N17
3311	N15
3312	K20
3313	N20
3314	K20
3315	N20
3320	K18
3321	K18
3322	K19
3323	L18
3325	N18
3326	N18
3327	N19
3328	M18
3360	L20
3361	M20
3501	O 2
3502	O 2
3550	F 3
3551	F 4
3552	G 4
3553	G 5
3610	H18
3611	I18
3612	I18
3613	I19
3614	H19
3615	H19
3616	I19
3617	I20
3662	M19
3663	L19
3664	M20
3665	M20
3700	F 5
3701	F 3
3706	C 8
3707	B 8
3708	B 7
3710	E 2
3711	C 2
3713	B 4
3714	B 3
3715	C 3
3716	C 2
3717	C 2
3718	C 1
3719	F 7
3720	F 7
3721	F 7
3722	B 7
3723	B 8
3724	B 8
6103	K 5
6550	G 4
6660	M19
7000	D16
7040	I 2
7041	I 2
7042	H 3
7043	H 4
7044	H 5
7060	I19
7060	G19
7080	F19
7080	A20
7101	G11
7102	I12
7140	N 6
7141	N 6
7300	L17
7300	K19
7301	M17
7301	N19
7360	L20
7361	M20
7362	L20
7500	N 3
7550	G 4
7660	O 8
7660	C20
7700	C 7
9055	M 5

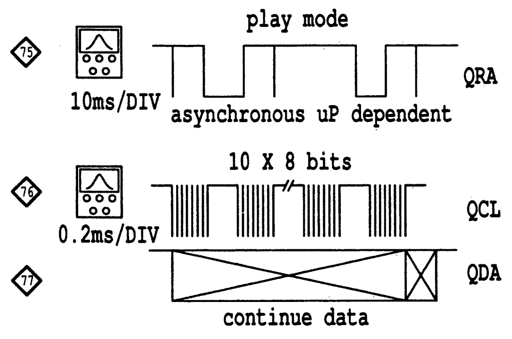


19 ACTIVITY DURING PLAY

21 ACTIVITY DURING PLAY

23 SERVICE POSITION SLEDGE
SL-OUT -2,6V
SL-IN +2,6V

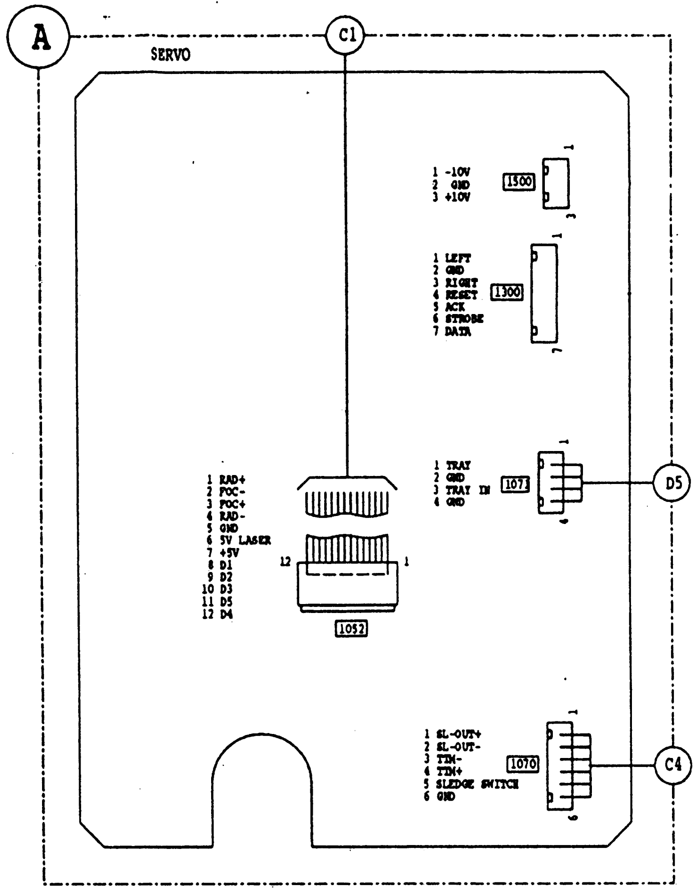
67 SERVICE POSITION SLEDGE,FOCUS,MOTOR: 0V
SERVICE POSITION RADIAL: 5V

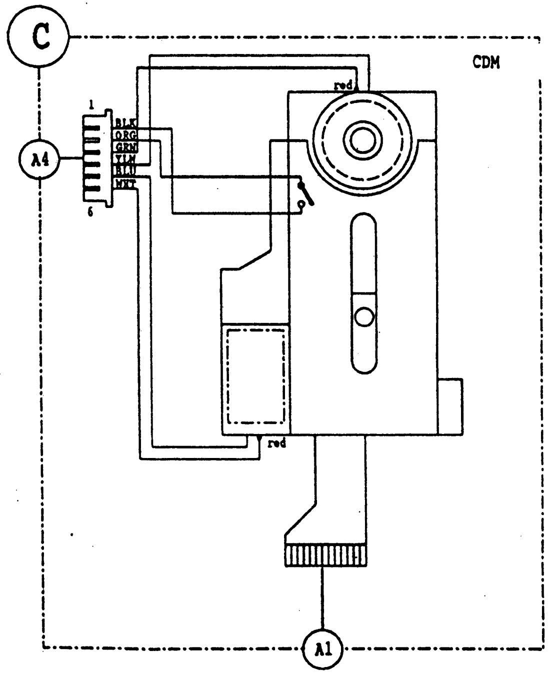


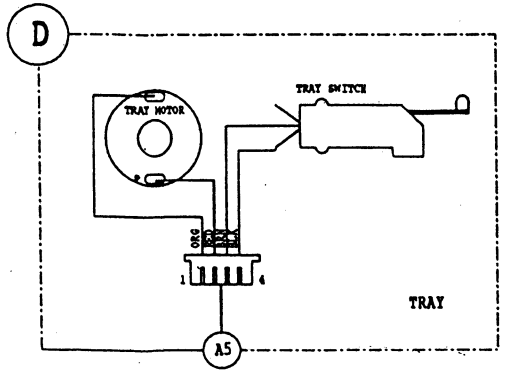
84 SERVICE POSITION SLEDGE
0V REST POSITION
+5V WHEN SLEDGE IS MOVING

85 +5V REST POSITION OF TRAY
0V WHEN OPENING OR CLOSING

WIRING DIAGRAM CD-PART


A
C1
SERVO
1 -10V
2 GND
3 +10V
1500
1 LEFT
2 GND
3 RIGHT
4 RESET
5 ACK
6 STROBE
7 DATA
1300
1 TRAY
2 GND
3 TRAY IN
4 GND
1073
D5
1 RAD+
2 FOC-
3 FOC+
4 RAD-
5 GND
6 5V LASER
7 +5V
8 D1
9 D2
10 D3
11 D5
12 D4
12
1
1052
1 SL-OUT+
2 SL-OUT-
3 TTM-
4 TTM+
5 SLEDGE SWITCH
6 GND
1070
C4


C
CDM
A4
1
BLK
ORG
GRN
YLW
BLU
WHT
6
red
red
A1

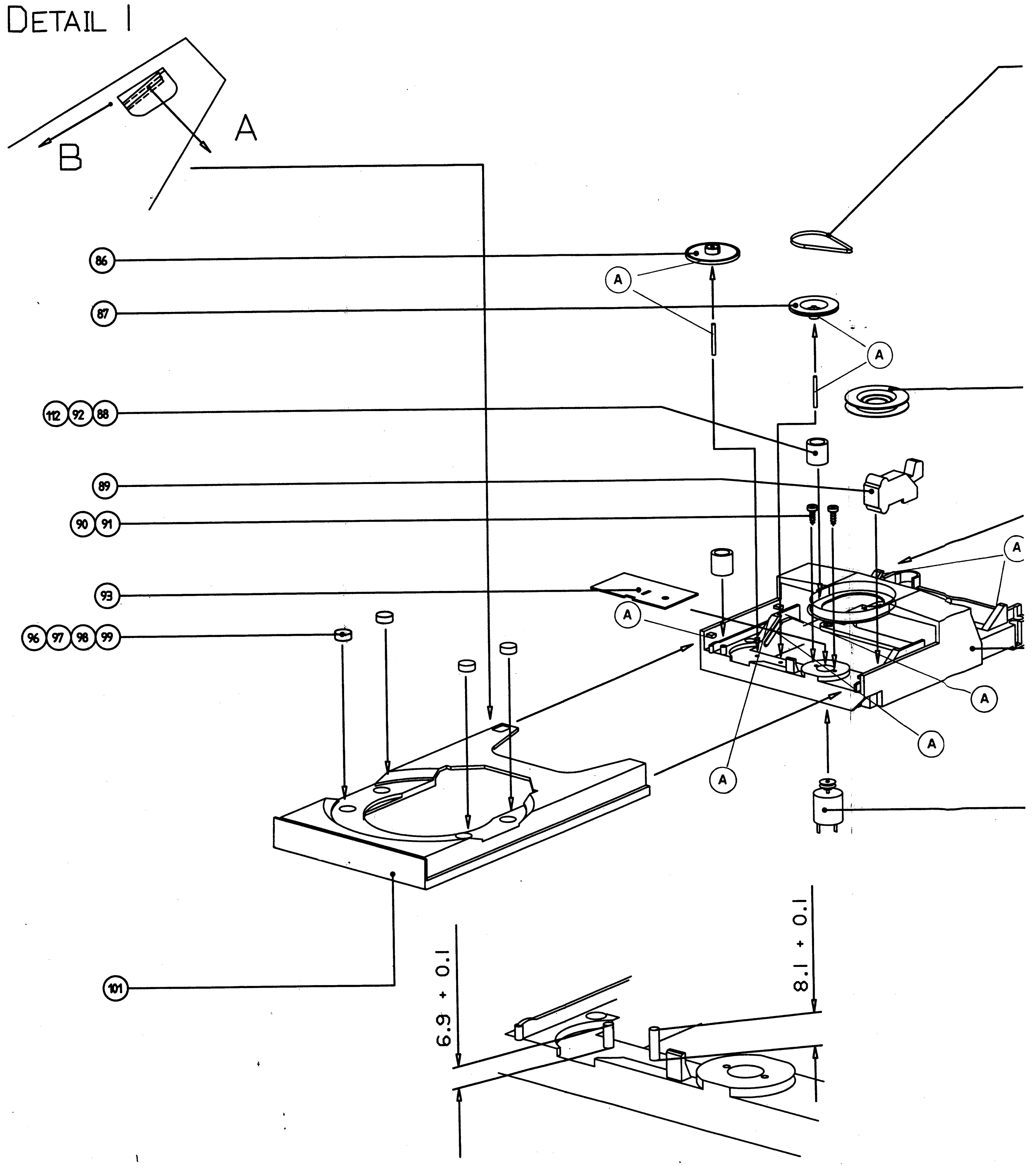

D
TRAY MOTOR
TRAY SWITCH
ORG
1
4
TRAY
A5

CD MECHANISM

86	4822 528 81464
87	4822 528 81465
88	4822 325 60379
89	4822 276 13222
93	4822 444 60816
96	4822 325 80511
101	4822 444 50679
102	4822 358 31168
103	4822 691 30278
104	4822 325 50215
108	4822 402 61412
109	4822 464 50895
110	4822 444 50678
111	4822 361 21492

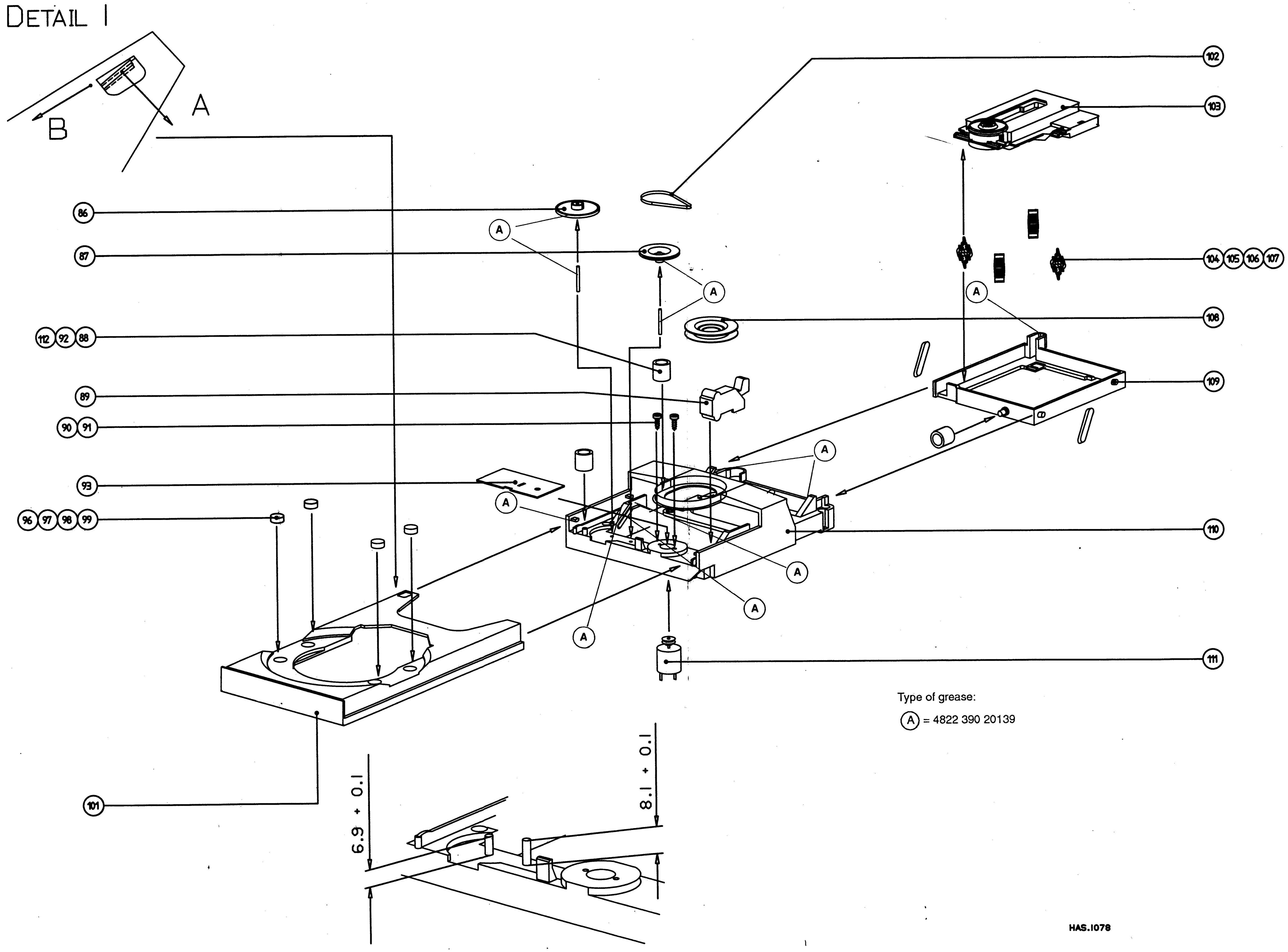
Note : Only the mentioned parts are normal service parts.

CD EXPLODED VIEW


DETAIL I
A
B
86
87
112
92
88
89
90
91
93
96
97
98
99
101
A
A
A
A
A
A
A
6.9 + 0.1
8.1 + 0.1

CD EXPLODED VIEW

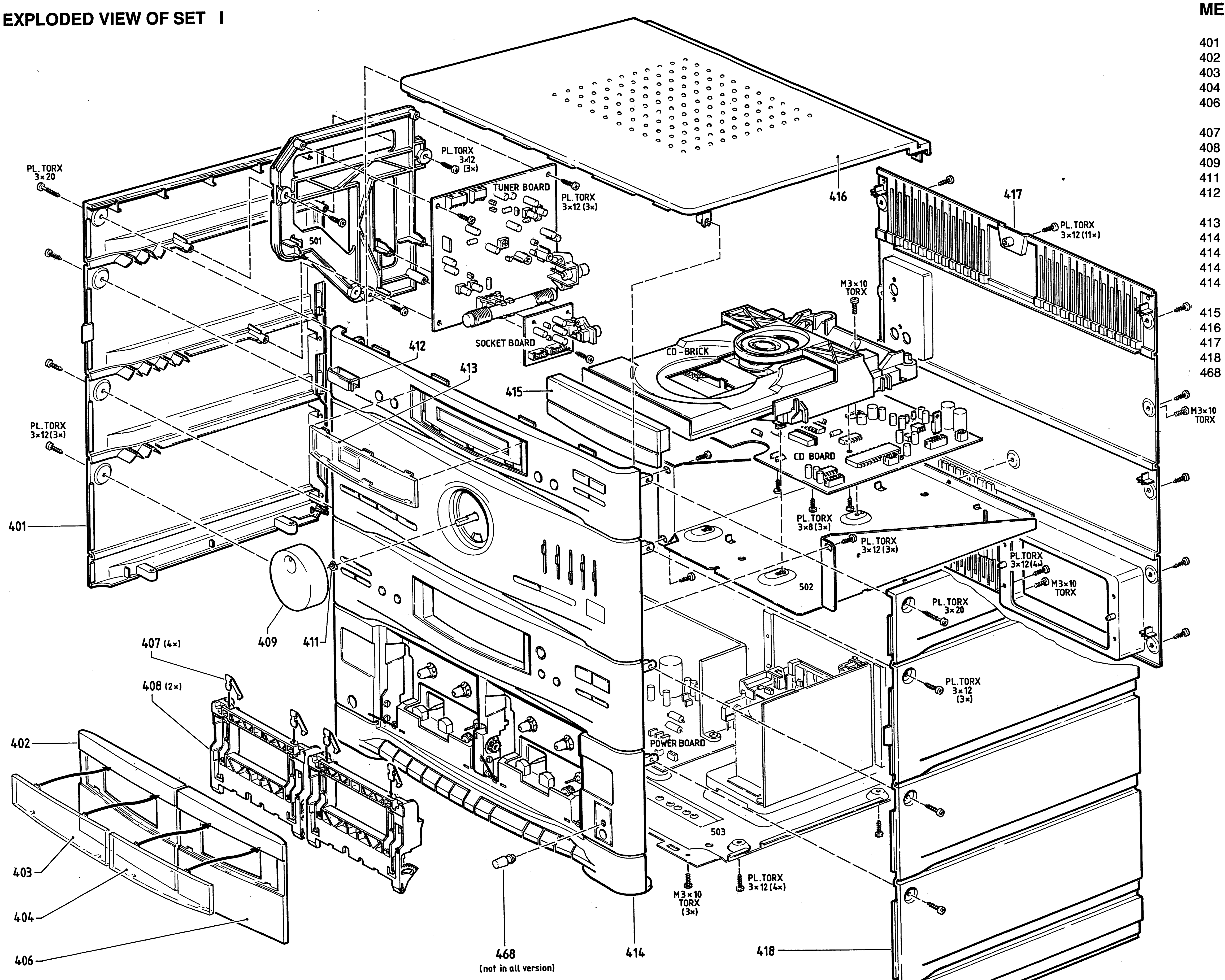
parts.


DETAIL I
B
A
86
87
112
92
88
89
90
91
93
96
97
98
99
101
102
103
104
105
106
107
108
109
110
111
A
6.9 + 0.1
8.1 + 0.1
HAS.1078

Type of grease:

(A) = 4822 390 20139

EXPLODED VIEW OF SET I

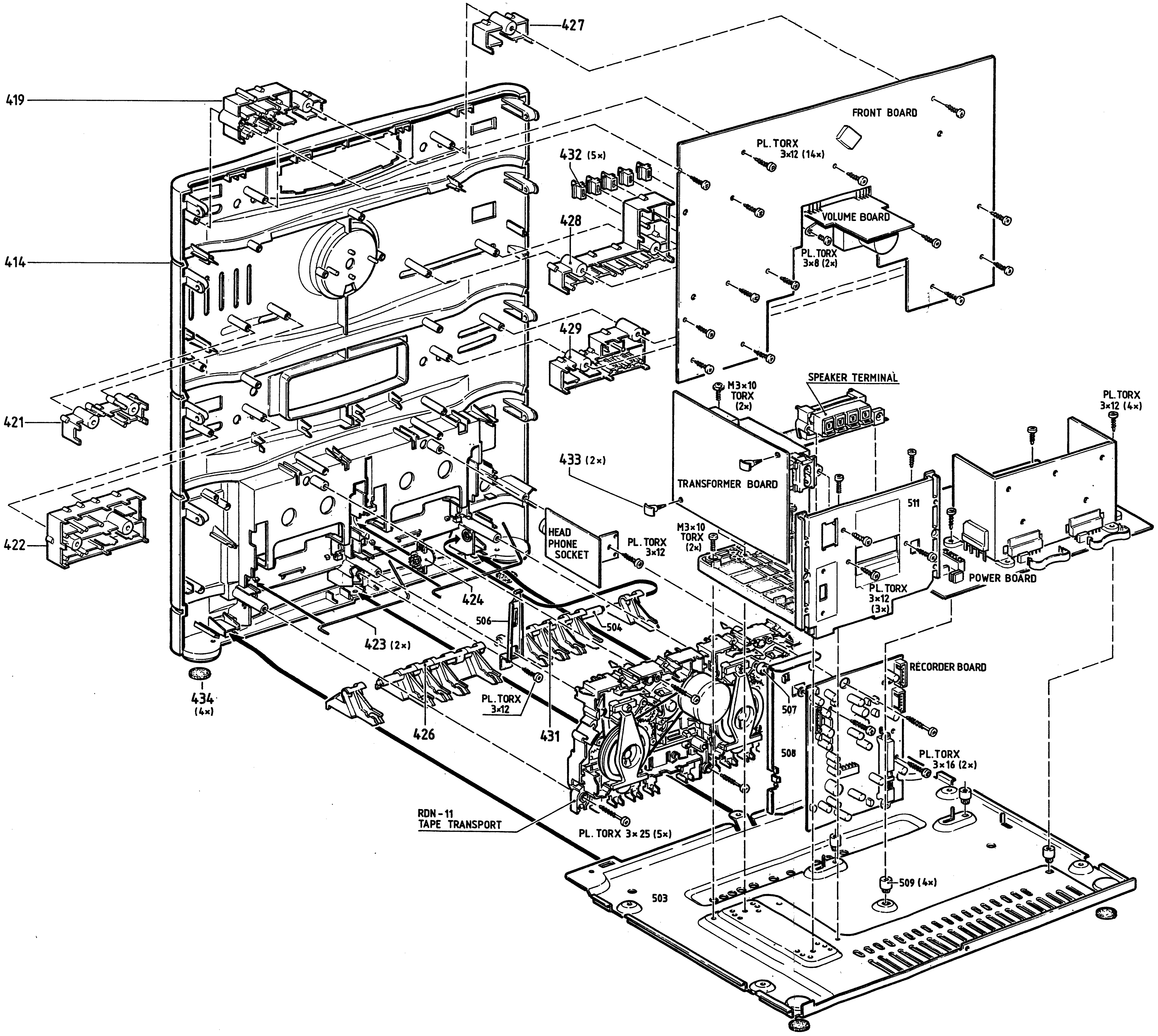

PL.TORX 3×20
PL.TORX 3×12 (3×)
TUNER BOARD
PL.TORX 3×12 (3×)
501
416
417
PL.TORX 3×12 (11×)
M3×10 TORX
SOCKET BOARD
CD-BRICK
412
413
415
CD BOARD
M3×10 TORX
PL.TORX 3×12(3×)
401
PL.TORX 3×8(3×)
PL.TORX 3×12 (3×)
PL.TORX 3×12(4×)
M3×10 TORX
502
PL.TORX 3×20
409
411
407 (4×)
408 (2×)
PL.TORX 3×12 (3×)
POWER BOARD
402
503
403
404
406
M3×10 TORX (3×)
PL.TORX 3×12 (4×)
468 (not in all version)
414
418

MECHANICAL PARTS

401	4822 426 30153	SIDE LEFT
402	4822 443 63936	CASS. DOOR A-DECK
403	4822 450 62087	WINDOW A-DECK
404	4822 450 62088	WINDOW B-DECK
406	4822 443 63935	CASS. DOOR B-DECK
407	4822 492 63927	SPRING,CASS.PRESS
408	4822 443 63037	DOOR,CASSETTE
409	4822 413 41792	KNOB VOLUME
411	4822 492 51374	SPRING KNOB CLAMP
412	4822 381 11418	IR WINDOW
413	4822 450 62074	WINDOW PRINTED
414	4822 426 51661	FRONT AS445/20
414	4822 426 51644	FRONT AS445/21,/30
414	4822 426 51643	FRONT AS440/37
414	4822 426 51642	FRONT AS440/20/22/25
415	4822 444 40661	FRONT CD TRAY
416	4822 426 60639	COVER
417	4822 426 20241	BACK PLATE
418	4822 426 30152	SIDE RIGHT
468	4822 410 62622	KNOB MICRO-MIX

CS 51 653

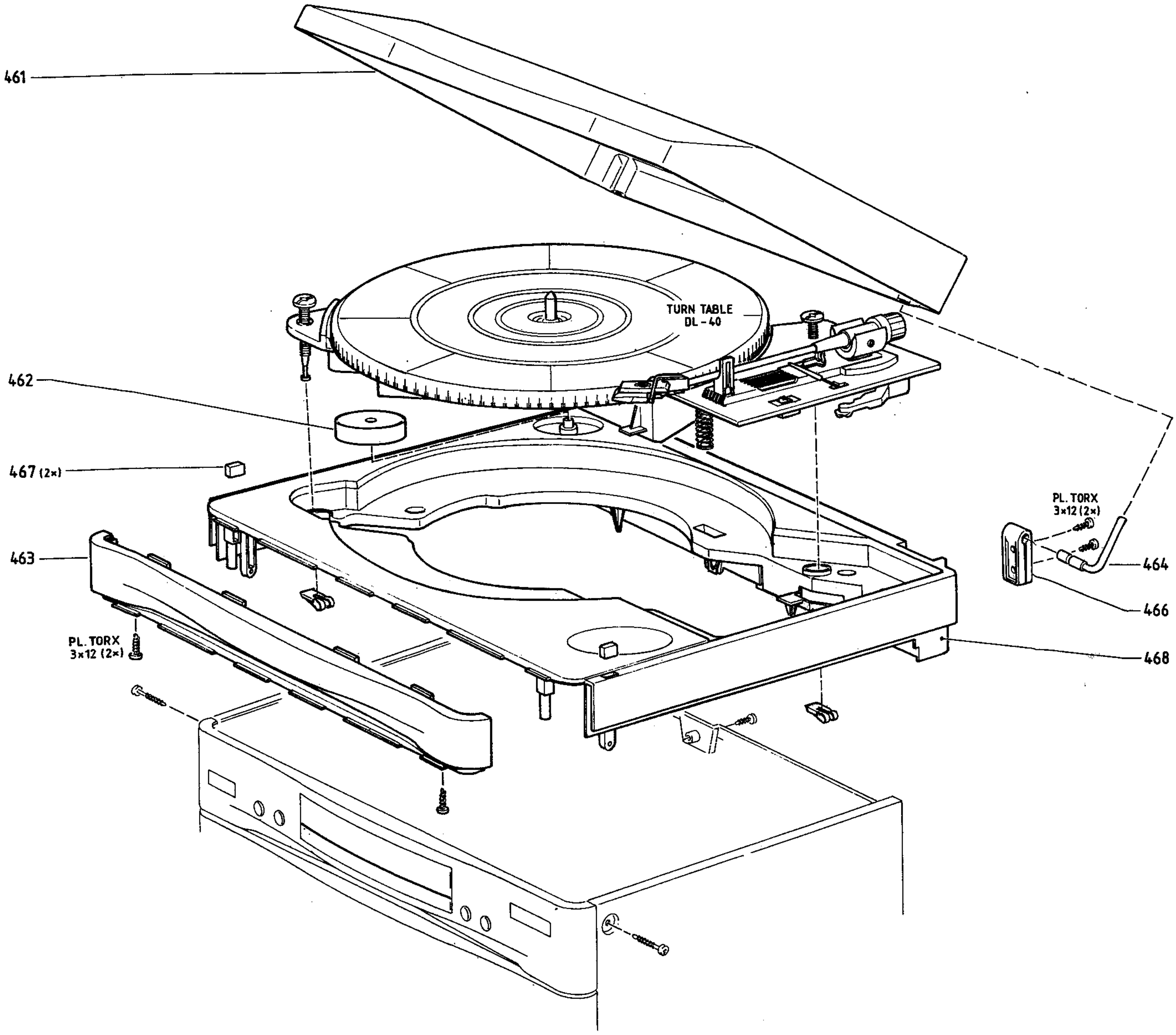
EXPLODED VIEW OF SET II


427
419
414
421
422
434
(4×)
423 (2×)
426
424
506
504
431
PL. TORX
3×12
432 (5×)
428
429
FRONT BOARD
PL. TORX
3×12 (14×)
VOLUME BOARD
PL. TORX
3×8 (2×)
SPEAKER TERMINAL
M3×10
TORX
(2×)
433 (2×)
TRANSFORMER BOARD
HEAD
PHONE
SOCKET
PL. TORX
3×12
M3×10
TORX
(2×)
511
PL. TORX
3×12
(3×)
POWER BOARD
PL. TORX
3×12 (4×)
RECORDER BOARD
507
508
PL. TORX
3×16 (2×)
RDN-11
TAPE TRANSPORT
PL. TORX 3×25 (5×)
503
509 (4×)

MECHANICAL PARTS

414	4822 426 51661	FRONT AS445/20
414	4822 426 51644	FRONT AS445/21,/30
414	4822 426 51643	FRONT AS440/37
414	4822 426 51642	FRONT AS440/20/22/25
419	4822 410 62618	KNOB PRSET UP/DOWN
421	4822 410 62624	KNOB HSD
422	4822 410 62626	KNOB CD RIGHT
423	4822 492 42595	SPRING CASS. COMPARTMENT
424	4822 529 10278	DAMPER
426	4822 410 62619	BUTTON SET
428	4822 410 62623	KNOB AUTOPROGRAM
428	4822 410 62617	KNOB SELECTOR+POWER
429	4822 410 62625	KNOB CD LEFT
431	4822 410 62621	BUTTON SET
432	4822 411 61929	KNOB EQUALIZER
433	4822 466 93148	SPACER
434	4822 462 40683	FOOT RUBBER
	4822 691 20842	RDN-11 TAPE TRANSPORTS

ONLY FOR SETS WITH RECORD PLAYER


461
TURN TABLE DL - 40
462
467 (2×)
463
PL. TORX 3×12 (2×)
PL. TORX 3×12 (2×)
464
466
468

MECHANICAL PARTS TURNTABLE

461	4822 462 71935	DUST COVER
462	4822 466 92642	ADAPTOR
463	4822 444 40662	FRONT TURNTABLE
464	4822 417 10631	CLAMPING BLOCK
466	4822 417 10631	CLAMPING BLOCK
467	4822 462 41656	RUBBER PAD
468	not a sparepart	

MICRO MIX BOARD

MISCELLANEOUS

1900	4822 267 30968	PHONE SOCKET

INTEGRATED CIRCUITS

7900	4822 209 83274	NJM4560D

RESISTORS

3900	4822 116 52256	2k2	5%	0,16W
3901	4822 116 52175	100R	5%	0,5W
3902	4822 116 52224	470R	5%	0,5W
3903	4822 116 52234	100k	5%	0,5W
3904	4822 116 52234	100k	5%	0,5W
3905	4822 100 11869	TRIMPOT 20k LIN.		
3906	4822 116 52175	100R	5%	0,5W
3907	4822 116 52234	100k	5%	0,5W
3908	4822 116 52238	12k	5%	0,5W
3909	4822 116 52233	10k	5%	0,5W
3910	4822 116 52224	470R	5%	0,5W
3911	4822 116 52238	12k	5%	0,5W
3912	4822 116 52303	8k2	5%	0,5W

CAPACITORS

2900	4822 124 40242	1µF	20%	63V
2901	4822 122 33195	100pF	10%	50V
2902	4822 122 33519	470pF	10%	50V
2903	4822 122 33848	47pF	5%	50V
2904	4822 124 40435	10µF	20%	50V
2905	4822 122 33848	47pF	5%	50V
2906	4822 122 33848	47pF	5%	50V
2907	4822 124 40435	10µF	20%	50V
2908	4822 124 40435	10µF	20%	50V
2909	4822 122 33195	100pF	10%	50V
2910	4822 122 33519	470pF	10%	50V
2911	4822 122 33848	47pF	5%	50V
2913	4822 124 40242	1µF	20%	63V
2914	4822 122 33848	47pF	5%	50V
2915	4822 124 40435	10µF	20%	50V
2916	4822 124 40435	10µF	20%	50V
2917	4822 124 41525	100µF	20%	25V
2918	4822 126 11585	22nF	50V	
2919	4822 124 40433	47µF	20%	25V

FRONT BOARD

MISCELLANEOUS

1408	4822 267 30631	CINCH SOCKET
1410	4822 267 30968	PHONE SOCKET
1415	4822 130 91245	FTD-11894
1416	4822 134 40965	LAMP INC. 12V 150mA
1417	4822 134 40965	LAMP INC. 12V 150mA
1421	4822 276 13114	TACT SWITCH
1422	4822 276 13114	TACT SWITCH
1424	4822 276 13114	TACT SWITCH
1425	4822 276 13114	TACT SWITCH
1426	4822 276 13114	TACT SWITCH
1427	4822 276 13114	TACT SWITCH
1428	4822 276 13114	TACT SWITCH
1429	4822 276 13114	TACT SWITCH
1430	4822 276 13114	TACT SWITCH
1431	4822 276 13114	TACT SWITCH
1432	4822 276 13114	TACT SWITCH
1433	4822 276 13114	TACT SWITCH
1434	4822 276 13114	TACT SWITCH
1435	4822 276 13114	TACT SWITCH
1436	4822 276 13114	TACT SWITCH
1437	4822 276 13114	TACT SWITCH
1438	4822 276 13114	TACT SWITCH
1439	4822 276 13114	TACT SWITCH
1440	4822 276 13114	TACT SWITCH
1441	4822 276 13114	TACT SWITCH
1442	4822 276 13114	TACT SWITCH
1443	4822 276 13114	TACT SWITCH
1444	4822 276 13114	TACT SWITCH
1446	4822 276 13114	TACT SWITCH
1447	4822 276 13114	TACT SWITCH
1448	4822 276 13114	TACT SWITCH

DIODES

6401	4822 130 30621	1N4148
6402	4822 130 30621	1N4148
6403	4822 130 30[illegible]	1[illegible]8
6404	4822 130 30621	1N4148
6405	4822 130 30621	1N4148
6406	4822 130 30621	1N4148
6407	4822 130 30621	1N4148
6408	4822 130 30621	1N4148
6409	4822 130 30621	1N4148
6410	4822 130 30621	1N4148
6411	4822 130 30621	1N4148
6412	4822 130 30621	1N4148
6413	4822 130 30621	1N4148
6414	4822 130 30621	1N4148
6415	4822 130 30621	1N4148
6416	4822 130 30621	1N4148
6418	4822 130 30621	1N4148
6419	4822 130 30621	1N4148
6420	4822 130 30621	1N4148
6421	4822 130 30621	1N4148
6422	4822 130 30621	1N4148
6423	4822 130 30621	1N4148
6424	4822 130 30621	1N4148
6425	4822 130 30621	1N4148
6427	4822 130 34174	BZX79-C4V7
6428	4822 130 34197	BZX79-C12 (UAW)
6431	4822 130 34174	BZX79-C4V7
6442	4822 130 82021	LTL307G

DIODES

6450	4822 130 30861	BZX79-C7V5
6453	4822 130 30621	1N4148
1006	4822 130 83092	LED from Volume pot

TRANSISTORS

7406	4822 130 40941	BC558
7408	4822 130 40938	BC548
7409	4822 130 41344	BC337-40
7410	4822 130 41344	BC337-40
7411	4822 130 41344	BC337-40
7412	4822 130 41344	BC337-40
7413	4822 130 40938	BC548
7421	4822 130 44196	BC548C
7423	4822 130 40941	BC558
7424	4822 130 41327	BC327-40
7426	4822 130 40941	BC558
7427	4822 130 40938	BC548
7432	4822 130 40938	BC548
7433	4822 130 40938	BC548
7440	4822 130 40941	BC558
7445	5322 130 44779	BC338-40
7446	5322 130 44779	BC338-40
7447	4822 130 44246	BC549C
7448	4822 130 44246	BC549C

INTEGRATED CIRCUITS

7403	4822 209 83274	NJM4560D
7407	4822 209 83274	NJM4560D
7415	4822 209 32392	TMP87CK20F-AS440.1
7418	4822 209 31508	ST24C01
7419	5322 209 10421	HEF4094BP
7420	5322 209 10421	HEF4094BP
7422	4822 214 52009	GP1U58XP
7425	5322 209 86518	MC7805CT

COILS

5401	5322 242 73697	CERAM.RES. 8MHz
5402	4822 157 50961	22µH
5405	4822 157 62552	COIL 2,2µH

RESISTORS

3401	4822 116 52297	68k	5%	0,5W
3402	4822 116 52297	68k	5%	0,5W
3403	4822 116 52264	27k	5%	0,5W
3404	4822 116 52264	27k	5%	0,5W
3405	4822 116 52284	47k	5%	0,5W
3406	4822 116 52284	47k	5%	0,5W
3407	4822 116 52269	3k3	5%	0,5W
3408	4822 116 52269	3k3	5%	0,5W
3409	4822 116 52263	2k7	5%	0,5W
3410	4822 116 52263	2k7	5%	0,5W
3413	4822 116 52234	100k	5%	0,5W
3414	4822 116 52234	100k	5%	0,5W
3415	4822 116 52233	10k	5%	0,5W
3416	4822 116 52233	10k	5%	0,5W
3417	4822 116 52284	47k	5%	0,5W
3418	4822 116 52284	47k	5%	0,5W
3419	4822 116 52284	47k	5%	0,5W
3420	4822 116 52284	47k	5%	0,5W
3421	4822 116 52284	47k	5%	0,5W
3422	4822 116 52284	47k	5%	0,5W

RESISTORS

3423	4822 116 52284	47k	5%	0,5W
3424	4822 116 52284	47k	5%	0,5W
3425	4822 116 52224	470R	5%	0,5W
3426	4822 116 52224	470R	5%	0,5W
3427	4822 116 52257	22k	5%	0,5W
3428	4822 116 52257	22k	5%	0,5W
3431	4822 116 52263	2k7	5%	0,5W
3432	4822 116 52263	2k7	5%	0,5W
3433	4822 116 52276	3k9	5%	0,5W
3434	4822 116 52276	3k9	5%	0,5W
3435	4822 050 11002	1k	5%	0,2W
3436	4822 050 11002	1k	5%	0,2W
3437	4822 116 52264	27k	5%	0,5W
3438	4822 116 52264	27k	5%	0,5W
3439	4822 116 52224	470R	5%	0,5W
3440	4822 116 52224	470R	5%	0,5W
3441	4822 116 52224	470R	5%	0,5W
3442	4822 116 52224	470R	5%	0,5W
3443	4822 116 52291	56k	5%	0,5W
3444	4822 116 52291	56k	5%	0,5W
3445	4822 051 10333	33k	2%	0,25W
3446	4822 051 10333	33k	2%	0,25W
3447	4822 051 10333	33k	2%	0,25W
3448	4822 051 10333	33k	2%	0,25W
3449	4822 116 52264	27k	5%	0,5W
3450	4822 116 52264	27k	5%	0,5W
3451	4822 051 10333	33k	2%	0,25W
3452	4822 051 10333	33k	2%	0,25W
3455	4822 051 10333	33k	2%	0,25W
3456	4822 051 10333	33k	2%	0,25W
3457	4822 116 52264	27k	5%	0,5W
3458	4822 116 52264	27k	5%	0,5W
3459	4822 051 10333	33k	2%	0,25W
3460	4822 051 10333	33k	2%	0,25W
3461	4822 051 10333	33k	2%	0,25W
3462	4822 051 10333	33k	2%	0,25W
3463	4822 116 52285	470k	5%	0,5W
3464	4822 116 52285	470k	5%	0,5W
3465	4822 116 52296	6k8	5%	0,5W
3466	4822 116 52296	6k8	5%	0,5W
3469	4822 116 52283	4k7	5%	0,5W
3470	4822 116 52283	4k7	5%	0,5W
3471	4822 116 52256	2k2	5%	0,16W
3472	4822 116 52256	2k2	5%	0,16W
3473	4822 116 52257	22k	5%	0,5W
3474	4822 116 52257	22k	5%	0,5W
3475	4822 116 52224	470R	5%	0,5W
3476	4822 116 52224	470R	5%	0,5W
3477	4822 116 52256	2k2	5%	0,16W
3478	4822 116 52283	4k7	5%	0,5W
3480	4822 102 10414	Pot 2x20kB		
3481	4822 101 21102	Pot 2x 50k		
3482	4822 101 21102	Pot 2x 50k		
3483	4822 101 21102	Pot 2x 50k		
3484	4822 101 21102	Pot 2x 50k		
3485	4822 101 21102	Pot 2x 50k		
3486	4822 050 11002	1k	5%	0,2W
3487	4822 050 11002	1k	5%	0,2W
3488	4822 050 11002	1k	5%	0,2W
3489	4822 050 11002	1k	5%	0,2W
3490	4822 116 52215	220R	5%	0,16W
3491	4822 116 52233	10k	5%	0,5W
3492	4822 116 52228	680R	5%	0,5W
3493	4822 116 52215	220R	5%	0,16W
3494	4822 116 52215	220R	5%	0,16W

RESISTORS

3495	4822 116 52215	220R	5%	0,16W
3496	4822 116 52215	220R	5%	0,16W
3497	4822 116 52257	22k	5%	0,5W
3498	4822 116 52233	10k	5%	0,5W
3499	4822 116 52215	220R	5%	0,16W
3500	4822 116 52217	270R	5%	0,5W
3501	4822 116 52269	3k3	5%	0,5W
3502	4822 050 11002	1k	5%	0,2W
3503	4822 050 11002	1k	5%	0,2W
3504	4822 116 52269	3k3	5%	0,5W
3505	4822 116 52251	18k	5%	0,5W
3506	4822 116 52175	100R	5%	0,5W
3507	4822 116 52217	270R	5%	0,5W
3508	4822 116 52217	270R	5%	0,5W
3516	4822 116 52233	10k	5%	0,5W
3517	4822 116 52233	10k	5%	0,5W
3526	4822 116 52228	680R	5%	0,5W
3528	4822 116 52304	82k	5%	0,5W
3530	4822 116 52233	10k	5%	0,5W
3531	4822 116 52283	4k7	5%	0,5W
3532	4822 116 52283	4k7	5%	0,5W
3533	4822 116 52283	4k7	5%	0,5W
3534	4822 116 52283	4k7	5%	0,5W
3535	4822 116 52283	4k7	5%	0,5W
3536	4822 116 52283	4k7	5%	0,5W
3537	4822 116 52217	270R	5%	0,5W
3538	4822 116 52217	270R	5%	0,5W
3539	4822 116 52217	270R	5%	0,5W
3540	4822 116 52258	220k	5%	0,5W
3552	4822 050 11002	1k	5%	0,2W
3554	4822 116 52233	10k	5%	0,5W
3555	4822 116 52233	10k	5%	0,5W
3556	4822 116 52233	10k	5%	0,5W
3557	4822 116 52233	10k	5%	0,5W
3558	4822 116 52256	2k2	5%	0,16W
3559	4822 116 52256	2k2	5%	0,16W
3560	4822 116 52283	4k7	5%	0,5W
3562	4822 050 11002	1k	5%	0,2W
3563	4822 116 52233	10k	5%	0,5W
3564	4822 050 11002	1k	5%	0,2W
3565	4822 050 11002	1k	5%	0,2W
3568	4822 116 52233	10k	5%	0,5W
3573	4822 050 11002	1k	5%	0,2W
3574	4822 116 52284	47k	5%	0,5W
3575	4822 050 11002	1k	5%	0,2W
3576	4822 051 10333	33k	2%	0,25W
3577	4822 116 52233	10k	5%	0,5W
3578	4822 116 52233	10k	5%	0,5W
3579	4822 116 52233	10k	5%	0,5W
3580	4822 116 52233	10k	5%	0,5W
3581	4822 116 52233	10k	5%	0,5W
3585	4822 116 52249	1k8	5%	0,16W
3586	4822 116 52175	100R	5%	0,5W
3587	4822 116 52175	100R	5%	0,5W
3589	4822 050 11002	1k	5%	0,2W
3590	4822 116 52257	22k	5%	0,5W
3591	4822 050 11002	1k	5%	0,2W
3592	4822 116 52257	22k	5%	0,5W
3593	4822 050 11002	1k	5%	0,2W
3594	4822 116 52224	470R	5%	0,5W
3595	4822 116 52224	470R	5%	0,5W
3596	4822 116 52224	470R	5%	0,5W
3597	4822 116 52224	470R	5%	0,5W
3598	4822 116 52256	2k2	5%	0,16W
3601	4822 116 52224	470R	5%	0,5W

RESISTORS

3602	4822 116 52224	470R	5%	0,5W
3603	4822 050 11002	1k	5%	0,2W
3604	4822 050 11002	1k	5%	0,2W
3605	4822 116 52207	1k2	5%	0,5W
3606	4822 116 52207	1k2	5%	0,5W
3607	4822 116 52256	2k2	5%	0,16W
3608	4822 116 52256	2k2	5%	0,16W
3609	4822 116 52296	6k8	5%	0,5W
3610	4822 116 52215	220R	5%	0,16W
3612	4822 116 52256	2k2	5%	0,16W
3613	4822 050 11002	1k	5%	0,2W
3615	4822 116 52224	470R	5%	0,5W
3616	4822 116 52215	220R	5%	0,16W
3617	4822 116 52228	680R	5%	0,5W
3618	4822 116 52233	10k	5%	0,5W
3620	4822 116 52233	10k	5%	0,5W
3621	4822 116 52224	470R	5%	0,5W
3622	4822 116 52224	470R	5%	0,5W
3623	4822 116 52224	470R	5%	0,5W
3624	4822 116 52224	470R	5%	0,5W
3649	4822 050 22205	2M2	1%	0,6W
3650	4822 050 22205	2M2	1%	0,6W
3651	4822 116 52257	22k	5%	0,5W
3652	4822 116 52257	22k	5%	0,5W
3653	4822 116 52235	1M	5%	0,5W
3654	4822 116 52235	1M	5%	0,5W
3655	4822 116 52224	470R	5%	0,5W
3660	4822 050 11002	1k	5%	0,2W
3661	4822 050 11002	1k	5%	0,2W
3662	4822 116 52224	470R	5%	0,5W
3663	4822 116 52224	470R	5%	0,5W
3664	4822 116 52228	680R	5%	0,5W
3665	4822 116 52256	2k2	5%	0,16W
3666	4822 116 52234	100k	5%	0,5W
3667	4822 116 52234	100k	5%	0,5W
3668	4822 050 11002	1k	5%	0,2W
3672	4822 050 11002	1k	5%	0,2W

CAPACITORS

2401	4822 124 40239	0,47µF	20%	63V
2402	4822 124 40239	0,47µF	20%	63V
2403	4822 124 40239	0,47µF	20%	63V
2404	4822 124 40239	0,47µF	20%	63V
2405	4822 124 40239	0,47µF	20%	63V
2406	4822 124 40239	0,47µF	20%	63V
2407	4822 124 40239	0,47µF	20%	63V
2408	4822 124 40239	0,47µF	20%	63V
2409	4822 122 33848	47pF	5%	50V
2410	4822 122 33848	47pF	5%	50V
2411	4822 122 33848	47pF	5%	50V
2412	4822 122 33848	47pF	5%	50V
2413	4822 122 33848	47pF	5%	50V
2414	4822 122 33848	47pF	5%	50V
2415	4822 122 33848	47pF	5%	50V
2416	4822 122 33848	47pF	5%	50V
2417	4822 126 12702	270pF	10%	50V
2418	4822 126 12702	270pF	10%	50V
2419	4822 122 33195	100pF	10%	50V
2420	4822 122 33195	100pF	10%	50V
2421	4822 122 33848	47pF	5%	50V
2422	4822 122 33848	47pF	5%	50V
2425	4822 122 33195	100pF	10%	50V
2426	4822 122 33195	100pF	10%	50V
2427	4822 124 40242	1µF	20%	63V

CAPACITORS

2428	4822 124 40242	1µF	20%	63V
2429	4822 126 12702	270pF	10%	50V
2430	4822 126 12702	270pF	10%	50V
2431	4822 122 33197	1nF	10%	50V
2432	4822 122 33197	1nF	10%	50V
2433	4822 122 33197	1nF	10%	50V
2434	4822 122 33197	1nF	10%	50V
2435	4822 126 11714	4,7nF	20%	
2436	4822 126 11714	4,7nF	20%	
2437	4822 126 11714	4,7nF	20%	
2438	4822 126 11714	4,7nF	20%	
2439	4822 126 11585	22nF		50V
2440	4822 126 11585	22nF		50V
2441	4822 126 11585	22nF		50V
2442	4822 126 11585	22nF		50V
2443	4822 121 43526	47nF	5%	100V
2444	4822 121 43526	47nF	5%	100V
2445	4822 121 42408	220nF	5%	63V
2446	4822 121 42408	220nF	5%	63V
2449	4822 122 33195	100pF	10%	50V
2450	4822 122 33195	100pF	10%	50V
2451	4822 124 40246	4,7uF	20%	63V
2452	4822 124 40246	4,7uF	20%	63V
2453	4822 121 51387	10nF	20%	16V
2454	4822 121 51387	10nF	20%	16V
2455	4822 122 33192	27pF	5%	50V
2456	4822 122 33192	27pF	5%	50V
2460	4822 124 40239	0,47µF	20%	63V
2461	4822 126 11585	22nF		50V
2462	4822 126 11585	22nF		50V
2463	4822 126 11585	22nF		50V
2464	4822 124 41525	100µF	20%	25V
2465	4822 124 22263	220µF	20%	25V
2466	4822 124 40248	10µF	20%	63V
2468	4822 124 40248	10µF	20%	63V
2469	4822 124 40242	1µF	20%	63V
2470	4822 124 40242	1µF	20%	63V
2471	4822 122 33519	470pF	10%	50V
2472	4822 122 33519	470pF	10%	50V
2473	4822 124 40433	47µF	20%	25V
2475	4822 124 22263	220µF	20%	25V
2476	4822 124 41525	100µF	20%	25V
2477	4822 124 40433	47µF	20%	25V
2483	4822 122 33197	1nF	10%	50V
2484	4822 122 33197	1nF	10%	50V
2502	4822 124 41525	100µF	20%	25V
2503	4822 124 41525	100µF	20%	25V
2504	5322 124 21643	22µF	20%	40V
2505	4822 126 11585	22nF		50V
2507	4822 126 12702	270pF	10%	50V
2510	4822 122 33848	47pF	5%	50V
2512	4822 124 40242	1µF	20%	63V
2513	4822 124 40248	10µF	20%	63V
2514	4822 126 12702	270pF	10%	50V
2552	4822 122 33197	1nF	10%	50V
2553	4822 122 33197	1nF	10%	50V
2554	4822 122 33197	1nF	10%	50V
2555	4822 122 33197	1nF	10%	50V
2556	4822 122 33195	100pF	10%	50V
2557	4822 122 33195	100pF	10%	50V
2558	5322 121 42386	100nF	5%	63V

RECORDER BOARD

DIODES

6701	4822 130 30621	1N4148
6702	4822 130 30621	1N4148
6704	4822 130 30621	1N4148
6705	4822 130 30621	1N4148
6706	4822 130 30621	1N4148
6707	4822 130 30621	1N4148
6710	4822 130 30621	1N4148
6712	4822 130 30621	1N4148

TRANSISTORS

7703	4822 130 40937	BC548B
7704	4822 130 40937	BC548B
7705	4822 130 40937	BC548B
7706	5322 130 44779	BC338-40
7707	5322 130 44779	BC338-40
7708	4822 130 44197	BC558B
7709	4822 130 40937	BC548B
7712	4822 130 44196	BC548C
7713	4822 130 44197	BC558B
7753	4822 130 40937	BC548B
7756	5322 130 44779	BC338-40
7757	5322 130 44779	BC338-40

INTEGRATED CIRCUITS

7701	4822 209 72491	KA2224
7702	4822 209 70288	UPC1313HA

COILS

5701	4822 157 51238	820µH
5702	4822 157 51238	820µH

RESISTORS

3701	4822 116 52224	470R	5%	0,5W
3702	4822 116 52224	470R	5%	0,5W
3703	4822 116 52224	470R	5%	0,5W
3704	4822 116 52258	220k	5%	0,5W
3705	4822 116 52188	27R	5%	0,5W
3706	4822 116 52175	100R	5%	0,5W
3709	4822 116 52175	100R	5%	0,5W
3710	4822 116 52289	5k6	5%	0,16W
3711	4822 116 52234	100k	5%	0,5W
3712	4822 116 52251	18k	5%	0,5W
3713	4822 116 52296	6k8	5%	0,5W
3715	4822 116 52257	22k	5%	0,5W
3716	4822 050 11002	1k	5%	0,2W
3717	4822 116 52256	2k2	5%	0,16W
3718	4822 116 52224	470R	5%	0,5W
3719	4822 116 52257	22k	5%	0,5W
3720	4822 116 52224	470R	5%	0,5W
3721	4822 116 52224	470R	5%	0,5W
3722	4822 116 52224	470R	5%	0,5W
3723	4822 116 52224	470R	5%	0,5W
3724	4822 116 52258	220k	5%	0,5W
3725	4822 116 52175	100R	5%	0,5W
3727	4822 050 22205	2M2	1%	0,6W
3730	4822 050 11002	1k	5%	0,2W
3731	4822 116 52207	1k2	5%	0,5W

RESISTORS

3732	4822 116 52233	10k	5%	0,5W
3733	4822 116 52207	1k2	5%	0,5W
3734	4822 116 52233	10k	5%	0,5W
3735	4822 116 52238	12k	5%	0,5W
3736	4822 116 52264	27k	5%	0,5W
3737	4822 116 52224	470R	5%	0,5W
3738	4822 116 52257	22k	5%	0,5W
3739	4822 116 52224	470R	5%	0,5W
3741	4822 050 11002	1k	5%	0,2W
3742	4822 050 11002	1k	5%	0,2W
3743	4822 116 52257	22k	5%	0,5W
3744	4822 116 52258	220k	5%	0,5W
3745	4822 116 52234	100k	5%	0,5W
3746	4822 116 52224	470R	5%	0,5W
3747	4822 116 52234	100k	5%	0,5W
3749	4822 116 52283	4k7	5%	0,5W
3751	4822 116 52224	470R	5%	0,5W
3752	4822 116 52224	470R	5%	0,5W
3753	4822 116 52224	470R	5%	0,5W
3754	4822 116 52258	220k	5%	0,5W
3755	4822 116 52188	27R	5%	0,5W
3756	4822 050 11002	1k	5%	0,2W
3760	4822 116 52289	5k6	5%	0,16W
3761	4822 116 52234	100k	5%	0,5W
3763	4822 116 52296	6k8	5%	0,5W
3765	4822 116 52257	22k	5%	0,5W
3766	4822 050 11002	1k	5%	0,2W
3767	4822 116 52256	2k2	5%	0,16W
3768	4822 116 52224	470R	5%	0,5W
3769	4822 116 52257	22k	5%	0,5W
3770	4822 116 52224	470R	5%	0,5W
3771	4822 116 52224	470R	5%	0,5W
3772	4822 116 52224	470R	5%	0,5W
3773	4822 116 52224	470R	5%	0,5W
3774	4822 116 52258	220k	5%	0,5W
3775	4822 116 52175	100R	5%	0,5W
3778	4822 052 10189	18R	5%	0,33W
3779	4822 116 52298	680k	5%	0,5W
3780	4822 050 11002	1k	5%	0,2W
3781	4822 116 52207	1k2	5%	0,5W
3782	4822 050 11002	1k	5%	0,2W
3783	4822 116 52258	220k	5%	0,5W
3785	4822 116 52238	12k	5%	0,5W
3786	4822 116 52264	27k	5%	0,5W
3788	4822 116 52257	22k	5%	0,5W
3789	4822 116 52224	470R	5%	0,5W
3791	4822 050 11002	1k	5%	0,2W
3792	4822 050 11002	1k	5%	0,2W
3796	4822 116 52257	22k	5%	0,5W
3797	4822 050 11002	1k	5%	0,2W
3798	4822 116 52231	820R	5%	0,5W
3799	4822 116 52234	100k	5%	0,5W

CAPACITORS

2701	4822 122 10173	820pF	10%	50V
2702	4822 122 10182	100pF	5%	50V
2703	4822 124 41643	100µF	20%	16V
2704	4822 126 11595	470pF	10%	50V
2705	4822 126 11325	4,7nF	10%	50V
2706	4822 124 40433	47µF	20%	25V
2708	4822 124 40435	10µF	20%	50V
2709	4822 121 41857	10nF	5%	250V
2711	4822 124 22633	22µF	20%	35V
2712	4822 126 11311	4,7nF		50V
2713	4822 124 40433	47µF	20%	25V
2720	4822 122 10174	1,5nF	10%	50V
2721	4822 122 33534	1,2nF	10%	50V
2722	4822 124 22466	1µF	20%	50V
2723	4822 124 22633	22µF	20%	35V
2724	4822 126 11595	470pF	10%	50V
2725	4822 124 40433	47µF	20%	25V
2726	4822 124 40433	47µF	20%	25V
2728	4822 124 40435	10µF	20%	50V
2730	4822 126 11325	4,7nF	10%	50V
2731	4822 121 41857	10nF	5%	250V
2732	4822 122 10158	1nF	10%	50V
2751	4822 122 10173	820pF	10%	50V
2753	4822 124 41643	100µF	20%	16V
2754	4822 126 11595	470pF	10%	50V
2758	4822 124 40435	10µF	20%	50V
2759	4822 121 41857	10nF	5%	250V
2762	4822 126 11311	4,7nF	50V	
2770	4822 122 10174	1,5nF	10%	50V
2771	4822 122 33534	1,2nF	10%	50V
2772	4822 124 22466	1µF	20%	50V
2773	4822 124 22633	22µF	20%	35V
2774	4822 126 11595	470pF	10%	50V
2775	4822 124 40184	1000µF	20%	10V
2778	4822 124 40435	10µF	20%	50V
2781	4822 121 41857	10nF	5%	250V
2782	4822 122 10158	1nF	10%	50V
2783	4822 121 41935	12nF	5%	250V
2784	4822 124 40242	1µF	20%	63V
2785	4822 121 51305	15nF	10%	50V
2786	4822 122 10183	100pF	5%	50V
2788	4822 124 40433	47µF	20%	25V
2789	4822 124 40433	47µF	20%	25V
2790	4822 124 40433	47µF	20%	25V
2791	4822 124 22263	220µF	20%	25V

POWER BOARD

MECHANICAL PARTS

4822 255 40128	CLIP TO126
5322 255 40397	CLIP IC

MISCELLANEOUS

1304	4822 267 31176	SPEAKER TERMINAL
1305	4822 264 30175	SOCKET EXT. SUPPLY

DIODES

6250	4822 130 82079	D3SBA20
6251	4822 130 30621	1N4148
6252	4822 130 30621	1N4148
6253	4822 130 34174	BZX79-C4V7
6254	4822 130 30621	1N4148
6255	5322 130 30684	1N4002
6256	5322 130 30684	1N4002
6257	5322 130 30684	1N4002
6258	5322 130 30684	1N4002
6259	4822 130 30621	1N4148
6261	5322 130 30684	1N4002
6350	4822 130 30621	1N4148
6351	4822 130 30621	1N4148
6352	4822 130 34278	BZX79-C6V8
6354	4822 130 30621	1N4148

TRANSISTORS

7250	4822 130 40937	BC548B
7252	4822 130 61236	BD234
7253	4822 130 40937	BC548B
7254	4822 130 40937	BC548B
7255	4822 130 44197	BC558B
7309	4822 130 41344	BC337-40
7310	4822 130 41344	BC337-40
7311	4822 130 41344	BC337-40
7312	4822 130 41344	BC337-40
7350	4822 130 41344	BC337-40
7351	4822 130 40937	BC548B
7352	4822 130 40937	BC548B

INTEGRATED CIRCUITS

7313	4822 209 73356	AN7161N(FP)
7314	4822 209 73356	AN7161N(FP)

COILS

5309	4822 157 62552	COIL 2,2µH
5310	4822 157 62552	COIL 2,2µH
5311	4822 157 62552	COIL 2,2µH
5312	4822 157 62552	COIL 2,2µH
5315	4822 157 62552	COIL 2,2µH
5316	4822 157 62552	COIL 2,2µH

RESISTORS

3250	4822 050 11002	1k	5%	0,2W
3251	4822 116 52233	10k	5%	0,5W
3252	4822 116 52233	10k	5%	0,5W
3254	4822 051 10333	33k	2%	0,25W
3255	4822 050 11002	1k	5%	0,2W
3256	4822 050 11002	1k	5%	0,2W
3257	4822 116 52233	10k	5%	0,5W
3258	4822 116 52283	4k7	5%	0,5W
3259	4822 051 10333	33k	2%	0,25W
3260	4822 116 52233	10k	5%	0,5W

RESISTORS

3261	4822 116 52291	56k	5%	0,5W
3262	4822 050 11002	1k	5%	0,2W
3263	4822 116 52283	4k7	5%	0,5W
3264	4822 116 52217	270R	5%	0,5W
3307	4822 116 52256	2k2	5%	0,16W
3308	4822 116 52256	2k2	5%	0,16W
3309	4822 050 11002	1k	5%	0,2W
3310	4822 050 11002	1k	5%	0,2W
3311	4822 050 11002	1k	5%	0,2W
3312	4822 050 11002	1k	5%	0,2W
3313	4822 116 52256	2k2	5%	0,16W
3314	4822 116 52256	2k2	5%	0,16W
3315	4822 116 52257	22k	5%	0,5W
3316	4822 116 52257	22k	5%	0,5W
3317	4822 116 52217	270R	5%	0,5W
3318	4822 116 52217	270R	5%	0,5W
3318	4822 116 52215	220R	5%	0,16W
3319	4822 052 10228	2R2	5%	0,33W
3320	4822 052 10228	2R2	5%	0,33W
3321	4822 052 10228	2R2	5%	0,33W
3322	4822 052 10228	2R2	5%	0,33W
3323	4822 116 52175	100R	5%	0,5W
3324	4822 116 52175	100R	5%	0,5W
3325	4822 116 52175	100R	5%	0,5W
3326	4822 116 52175	100R	5%	0,5W
3350	4822 052 10479	47R	5%	0,3W
3351	4822 116 52276	3k9	5%	0,5W
3352	4822 116 52233	10k	5%	0,5W
3353	4822 116 52233	10k	5%	0,5W
3354	4822 116 52234	100k	5%	0,5W
3355	4822 116 52217	270R	5%	0,5W

CAPACITORS

2250	5322 121 42578	100nF	10%	100V
2251	5322 121 42386	100nF	5%	63V
2252	5322 121 42386	100nF	5%	63V
2253	4822 124 42119	4700µF	20%	25V
2254	4822 124 40242	1µF	20%	63V
2255	4822 122 33197	1nF	10%	50V
2256	4822 126 11585	22nF	50V	
2257	5322 121 42578	100nF	10%	100V
2258	5322 121 42386	100nF	5%	63V
2259	5322 121 42386	100nF	5%	63V
2260	4822 124 22412	2200µF	20%	16V
2261	4822 124 40201	1000µF	20%	16V
2262	4822 124 41525	100µF	20%	25V
2265	4822 124 41994	3300µF	20%	16V
2266	4822 122 33197	1nF	10%	50V
2267	4822 122 33197	1nF	10%	50V
2311	4822 124 40242	1µF	20%	63V
2312	4822 124 40242	1µF	20%	63V
2315	5322 121 42489	33nF	5%	100V
2316	5322 121 42489	33nF	5%	100V
2317	4822 124 40242	1µF	20%	63V
2318	4822 124 40242	1µF	20%	63V
2319	4822 124 40433	47µF	20%	25V
2320	4822 124 40433	47µF	20%	25V
2321	4822 122 33169	680pF	10%	50V

CAPACITORS

2322	4822 122 33169	680pF	10%	50V
2323	5322 122 32777	1,8nF	10%	50V
2324	5322 122 32777	1,8nF	10%	50V
2325	4822 124 40196	220µF	20%	16V
2326	4822 124 40196	220µF	20%	16V
2329	5322 124 41431	22µF	20%	25V
2330	5322 124 41431	22µF	20%	25V
2333	4822 124 40433	47µF	20%	25V
2334	4822 124 40433	47µF	20%	25V
2335	4822 124 40433	47µF	20%	25V
2336	4822 124 40433	47µF	20%	25V
2337	4822 121 42408	220nF	5%	63V
2338	4822 121 42408	220nF	5%	63V
2339	4822 121 42408	220nF	5%	63V
2340	4822 121 42408	220nF	5%	63V
2350	4822 124 41525	100µF	20%	25V
2351	5322 121 42386	100nF	5%	63V
2352	5322 121 42386	100nF	5%	63V
2353	5322 121 42386	100nF	5%	63V
2354	4822 124 40242	1µF	20%	63V
2355	4822 126 12705	47pF	5%	50V
2356	4822 126 12705	47pF	5%	50V
2357	4822 124 40435	10µF	20%	50V
2361	4822 122 10177	10nF	20%	25V
2362	4822 122 10177	10nF	20%	25V

TRAFO BOARD

MISCELLANEOUS

1250	4822 071 55002	FUSE T5A
1250	4822 252 51123	FUSE T6,3A
1251	4822 071 56301	Fuse T 630mA/250V
1252	4822 071 56301	Fuse T 630mA/250V
1252	4822 253 30334	FUSE T1,25A
1255	4822 265 31015	MAINS SOCKET NOT FOR /37
1255	4822 265 31016	MAINS SOCKET ONLY FOR /37
1260	4822 272 10269	VOLTAGE SELECTOR

Values for fuses see Circuit Diagram on page 39

5250	4822 146 31239	TRAFO /20, /22
5250	4822 146 31234	TRAFO /37
5250	4822 146 31235	TRAFO AS445/21, /30
5250	4822 146 31235	TRAFO AS445/21, /30
5250	4822 146 31254	TRAFO /25

COILS

5251	4822 157 70003	COIL, MAINS FILTER

RESISTORS

3298	4822 053 21106	10M	5%	0,5W

ECO4 Tuner

MISCELLANEOUS

1101	4822 267 10283	SOCKET COAX IEC 75R
1101	4822 265 20598	F-CONNECT. COAX 75R

DIODES

6105	4822 130 83075	HN1V02H
6109	4822 130 82833	1SV228
6122	4822 130 30621	1N4148
6121	4822 130 30621	1N4148
6123	4822 130 30621	1N4148
6124	4822 130 82833	1SV228
6140	4822 130 30621	1N4148
6154	4822 130 30621	1N4148
6174	4822 130 34233	BZX79-B5V1

TRANSISTORS

7102	5322 130 42136	BC848C(CHIP)
7104	5322 130 42136	BC848C(CHIP)
7105	4822 130 60093	2SA838B
7120	4822 130 60163	2SC1047
7121	5322 130 42136	BC848C(CHIP)
7123	5322 130 42136	BC848C(CHIP)
7128	5322 130 42136	BC848C(CHIP)
7152	5322 130 41983	BC858B(CHIP)
7156	4822 130 41344	BC337-40
7157	4822 130 41344	BC337-40
7169	5322 130 41983	BC858B(CHIP)
7170	5322 130 42136	BC848C(CHIP)
7171	5322 130 42136	BC848C(CHIP)
7174	5322 130 41983	BC858B(CHIP)
7178	5322 130 41983	BC858B(CHIP)
7179	5322 130 42136	BC848C(CHIP)

INTEGRATED CIRCUITS

7140	4822 209 32011	TEA5712T/N1 (Radio-IC)
7150	5322 209 14482	HEF4069UBT (6xINVERTER)
7172	4822 209 30606	MM74HCU04M (6xINVERTER)
7173	4822 209 31998	LC7218M SYNTHESIZER

COILS

5105	4822 158 60641	Ferrite ant.,MW/LW	
5106	4822 158 60642	Ferrite ant.,MW	
5109	4822 156 30947	RF COIL var. 1,5 TURNS	
5120	4822 156 30947	RF COIL var. 1,5 TURNS	
5122	4822 157 60517	COIL var. 110µH	8%
5123	4822 157 60517	COIL var. 110µH	8%
5140	4822 158 60511	AM-IF FILTER 450kHz	
5142	4822 157 70302	AM-IF FILTER 450kHz	
5143	4822 242 70665	CER. FILTER 10,7MHZ	
5144	4822 242 70665	CER. FILTER 10,7MHZ	
5145	4822 242 81362	CER. DISCRIMINATOR	
5150	4822 157 50975	1mH	10%
5170	4822 242 72976	CER.RESONATOR 7,2MHz	
5171	4822 157 50963	2,2µH	

RESISTORS

3119	4822 116 52224	470R	5%	0,5W
3120	4822 116 52289	5k6	5%	0,16W
3124	4822 116 52256	2k2	5%	0,16W
3132	4822 116 52283	4k7	5%	0,5W
3141	4822 116 52215	220R	5%	0,16W
3148	4822 100 11682	POTMETER 47k LIN.		
3151	4822 116 52243	1k5	5%	0,16W
3156	4822 116 52233	10k	5%	0,5W
3162	4822 050 11002	1k	5%	0,2W
3163	4822 050 11002	1k	5%	0,2W
3164	4822 116 52283	4k7	5%	0,5W
3165	4822 116 52283	4k7	5%	0,5W
3170	4822 116 52283	4k7	5%	0,5W
3173	4822 116 52244	15k	5%	0,5W
3174	4822 116 52233	10k	5%	0,5W
3177	4822 116 52233	10k	5%	0,5W
3181	4822 116 52234	100k	5%	0,5W
3189	4822 116 52249	1k8	5%	0,16W
3190	4822 116 52249	1k8	5%	0,16W
3191	4822 116 52249	1k8	5%	0,16W
3192	4822 116 52249	1k8	5%	0,16W
3193	4822 116 52224	470R	5%	0,5W
3194	4822 050 24701	470R	5%	
3195	4822 050 24701	470R	5%	
3197	4822 050 24701	470R	5%	

CHIP RESISTORS

3106	4822 051 20104	100k	5%	0,1W
3107	4822 051 20222	2k2	5%	0,1W
3108	4822 051 20104	100k	5%	0,1W
3109	4822 051 20222	2k2	5%	0,1W
3110	4822 051 20473	47k	5%	0,1W
3111	4822 051 20153	15k	5%	0,1W
3112	4822 051 20223	22k	5%	0,1W
3116	4822 051 20335	3M3	5%	0,1W
3121	4822 051 20104	100k	5%	0,1W
3122	4822 051 20471	470R	5%	0,1W
3123	4822 051 20223	22k	5%	0,1W
3125	4822 051 20472	4k7	5%	0,1W
3128	4822 051 20222	2k2	5%	0,1W
3129	4822 051 20472	4k7	5%	0,1W
3142	4822 051 20222	2k2	5%	0,1W
3144	4822 051 20473	47k	5%	0,1W
3147	4822 051 20184	180k	5%	0,1W
3149	4822 051 20683	68k	5%	0,1W
3154	4822 051 20333	33k	5%	0,1W
3155	4822 051 20333	33k	5%	0,1W
3157	4822 051 20473	47k	5%	0,1W
3158	4822 051 20189	18R	5%	0,1W
3160	4822 051 20823	82k	5%	0,1W
3161	4822 051 20823	82k	5%	0,1W
3166	4822 051 20101	100R	5%	0,1W
3167	4822 051 20008	CHIP JUMPER 0805		
3171	4822 051 20101	100R	5%	0,1W
3172	4822 051 20472	4k7	5%	0,1W
3175	4822 051 20104	100k	5%	0,1W
3176	4822 051 20104	100k	5%	0,1W
3178	4822 051 20104	100k	5%	0,1W
3179	4822 051 20223	22k	5%	0,1W
3180	4822 051 20104	100k	5%	0,1W
3183	4822 051 20223	22k	5%	0,1W
3184	4822 051 20223	22k	5%	0,1W

CHIP RESISTORS

3185	4822 051 20104	100k	5%	0,1W
3186	4822 051 20104	100k	5%	0,1W
3188	4822 051 10102	1k	2%	0,25W
3211	4822 051 10008	CHIP JUMPER 1206		
3212	4822 051 10008	CHIP JUMPER 1206		
3213	4822 051 10008	CHIP JUMPER 1206		
3220	4822 051 20008	CHIP JUMPER 0805		
3222	4822 051 20008	CHIP JUMPER 0805		
3222	4822 051 20008	CHIP JUMPER 0805		
3223	4822 051 20008	CHIP JUMPER 0805		
3224	4822 051 20008	CHIP JUMPER 0805		
3226	4822 051 20008	CHIP JUMPER 0805		
3226	4822 051 20008	CHIP JUMPER 0805		
3228	4822 051 10008	CHIP JUMPER 1206		
3229	4822 051 20008	CHIP JUMPER 0805		
3229	4822 051 20008	CHIP JUMPER 0805		
3233	4822 051 20008	CHIP JUMPER 0805		
3237	4822 051 10008	CHIP JUMPER 1206		
3238	4822 051 20008	CHIP JUMPER 0805		
3240	4822 051 10008	CHIP JUMPER 1206		
3241	4822 051 20008	CHIP JUMPER 0805		
3241	4822 051 20008	CHIP JUMPER 0805		
3242	4822 051 10008	CHIP JUMPER 1206		
3243	4822 051 20008	CHIP JUMPER 0805		
3243	4822 051 20008	CHIP JUMPER 0805		
3244	4822 051 20008	CHIP JUMPER 0805		
3245	4822 051 20008	CHIP JUMPER 0805		
3245	4822 051 20008	CHIP JUMPER 0805		
3246	4822 051 10008	CHIP JUMPER 1206		
3247	4822 051 10008	CHIP JUMPER 1206		
3248	4822 051 20008	CHIP JUMPER 0805		
3249	4822 051 20153	15k	5%	0,1W
3249	4822 051 20821	820R	5%	0,1W
3249	4822 051 20821	820R	5%	0,1W

CAPACITORS

2100	4822 122 33195	100pF	10%	50V
2104	4822 122 33195	100pF	10%	50V
2107	4822 122 31746	1nF	5%	50V
2115	4822 125 60101	10pF VARIABLE		
2122	4822 122 31746	1nF	5%	50V
2123	4822 122 31746	1nF	5%	50V
2124	4822 121 51387	10nF	20%	16V
2129	4822 121 43705	390pF	1%	160V
2130	4822 125 50355	4,2 - 20pF VARIABLE		
2134	4822 122 33197	1nF	10%	50V
2135	4822 121 70245	560pF	1%	160V
2141	4822 124 40244	2,2µF	20%	63V
2142	4822 124 40242	1µF	20%	63V
2150	4822 124 40435	10µF	20%	50V
2151	4822 124 40435	10µF	20%	50V
2156	5322 126 10181	100nF		25V
2157	5322 126 10181	100nF		25V
2158	4822 122 31746	1nF	5%	50V
2159	4822 122 31746	1nF	5%	50V
2160	4822 124 40242	1µF	20%	63V
2161	4822 124 40242	1µF	20%	63V
2162	4822 124 40242	1µF	20%	63V
2172	4822 124 41631	1,5µF	20%	50V
2173	4822 124 40433	47µF	20%	25V
2177	5322 126 10181	100nF		25V

CAPACITORS

2178	4822 122 33197	1nF	10%	50V
2179	4822 122 33195	100pF	10%	50V
2184	4822 124 41584	100µF	20%	10V
2186	4822 122 31746	1nF	5%	50V

CHIP CAPACITORS

2110	5322 122 32659	33pF	5%	50V
2110	5322 122 32269	6,8pF	5%	50V
2110	5322 122 32269	6,8pF	5%	50V
2112	4822 122 33496	100nF	10%	63V
2114	5322 122 32531	100pF	5%	50V
2120	5322 122 32268	470pF	10%	50V
2121	5322 122 32481	15pF	5%	50V
2133	4822 122 33177	10nF	20%	50V
2138	5322 122 32658	22pF	5%	50V
2138	5322 122 32658	22pF	5%	50V
2139	4822 122 32627	2,2nF	10%	50V
2143	4822 122 33325	470nF	20%	50V
2144	4822 122 33325	470nF	20%	50V
2145	4822 122 33496	100nF	10%	63V
2146	5322 122 33063	2,2pF	10%	50V
2147	4822 122 33177	10nF	20%	50V
2152	4822 122 33496	100nF	10%	63V
2154	4822 122 33175	2,2nF	20%	50V
2155	4822 122 33175	2,2nF	20%	50V
2158	4822 122 31775	680pF	5%	50V
2159	4822 122 31775	680pF	5%	50V
2168	4822 122 33481	1,8nF	5%	NP0
2169	5322 122 31863	330pF	5%	50V
2170	5322 126 10223	4,7nF	10%	63V
2171	5322 126 10223	4,7nF	10%	63V
2174	5322 116 80853	560pF	5%	63V
2175	5322 122 32531	100pF	5%	50V
2180	5322 122 31946	27pF	5%	50V
2181	4822 122 32139	12pF	5%	63V
2183	4822 122 33496	100nF	10%	63V
2185	4822 122 33496	100nF	10%	63V

TUNER 92

MISCELLANEOUS

1101	4822 210 10492	FRONTEND ASSY /02/08
1110	4822 267 10283	SOCKET COAX IEC 75R

DIODES

6101	4822 130 34174	BZX79-C4V7
6102	4822 130 83075	HN1V02H
6109	4822 130 30621	1N4148

TRANSISTORS

7101	4822 130 60163	2SC1047
7104	5322 130 60068	BC558C
7106	5322 130 60068	BC558C
7107	5322 130 41982	BC848 (CHIP)
7108	4822 130 44196	BC548C
7109	4822 130 44196	BC548C
7111	5322 130 41982	BC848 (CHIP)
7112	4822 130 60163	2SC1047
7113	4822 130 44196	BC548C
7114	4822 130 40937	BC548B
7115	4822 130 41024	BF245B
7116	4822 130 60163	2SC1047
7119	5322 130 41983	BC858B(CHIP)
7120	4822 130 44196	BC548C
7150	5322 130 44779	BC338-40
7151	4822 130 60163	2SC1047
7157	5322 130 44779	BC338-40

INTEGRATED CIRCUITS

7103	4822 209 31001	LA1851N
7105	4822 209 30178	LC7218

COILS

5101	4822 157 53192	0,22µH
5103	4822 242 81249	CER. FILTER 10,7MHz
5104	4822 157 63029	AM IF COIL
5105	4822 157 63904	Q-DETECION COIL
5106	4822 157 63802	BIRDY FILTER
5108	4822 157 63912	OSC.COIL AM 3-BAND
5110	4822 242 71878	CERAM.RES. 450kHz
5111	4822 242 81248	CER. FILTER 10,7MHz
5112	4822 242 72976	CER.RESONATOR 7,2MHz
5113	4822 242 81249	CER. FILTER 10,7MHz
5114	4822 152 20699	560µH
5127	4822 158 60643	FERROCEPTOR

RESISTORS

3101	4822 052 10478	4R7	5%	NFR
3108	4822 116 52224	470R	5%	0,5W
3113	4822 050 22201	220R	2%	0,25W
3118	4822 050 22201	220R	2%	0,25W
3120	4822 052 10229	22R	5%	0,33W
3125	4822 100 11213	22k	30%	POT.
3131	4822 100 11319	4k7 trimpot.		
3134	4822 050 15602	5k6	1%	0,4W
3138	4822 116 83922	150R	5%	1W
3147	4822 050 15602	5k6	1%	0,4W
3150	4822 050 25601	560R	1%	0,6W
3151	4822 050 24702	4k7	1%	0,6W
3155	4822 050 22201	220R	2%	0,25W
3158	4822 050 24702	4k7	1%	0,6W
3162	4822 050 22701	270R	1%	0,6W

RESISTORS

3165	4822 050 21002	1k	1%	0,6W
3166	4822 050 21002	1k	1%	0,6W
3167	4822 050 21002	1k	1%	0,6W
3183	4822 050 21003	10k	2%	0,25W
3186	4822 050 21003	10k	2%	0,25W
3225	4822 050 21002	1k	1%	0,6W
3244	5322 116 44005	250R	25%	

CHIP RESISTORS

3102	4822 051 20224	220k	5%	0,1W
3104	4822 051 20154	150k	5%	0,1W
3105	4822 051 20562	5k6	5%	0,1W
3106	4822 051 20829	82R	5%	0,1W
3107	4822 051 20104	100k	5%	0,1W
3114	4822 051 20332	3k3	5%	0,1W
3115	4822 051 20391	390R	5%	0,1W
3116	4822 051 20478	4R7	5%	0,1W
3117	4822 051 20331	330R	5%	0,1W
3121	4822 051 20272	2k7	5%	0,1W
3122	4822 051 20562	5k6	5%	0,1W
3123	4822 051 20223	22k	5%	0,1W
3124	4822 051 20103	10k	5%	0,1W
3126	4822 051 20123	12k	2%	0,1W
3127	4822 051 20562	5k6	5%	0,1W
3129	4822 051 20103	10k	5%	0,1W
3132	4822 051 20183	18k	5%	0,1W
3133	4822 051 20008	CHIP JUMPER 0805		
3135	4822 051 10008	CHIP JUMPER 1206		
3141	4822 051 20472	4k7	5%	0,1W
3142	4822 051 20472	4k7	5%	0,1W
3143	4822 051 20821	820R	5%	0,1W
3144	4822 051 20331	330R	5%	0,1W
3145	4822 051 20271	270R	5%	0,1W
3148	4822 051 20104	100k	5%	0,1W
3149	4822 051 20472	4k7	5%	0,1W
3152	4822 051 20103	10k	5%	0,1W
3153	4822 051 20274	270k	5%	0,1W
3156	4822 051 20153	15k	5%	0,1W
3157	4822 051 20472	4k7	5%	0,1W
3159	4822 051 20104	100k	5%	0,1W
3160	4822 051 20104	100k	5%	0,1W
3163	4822 051 20103	10k	5%	0,1W
3164	4822 051 20473	47k	5%	0,1W
3170	4822 051 20103	10k	5%	0,1W
3171	4822 051 20223	22k	5%	0,1W
3172	4822 051 20472	4k7	5%	0,1W
3173	4822 051 20223	22k	5%	0,1W
3184	4822 051 20332	3k3	5%	0,1W
3185	4822 051 20103	10k	5%	0,1W
3187	4822 051 20103	10k	5%	0,1W
3190	4822 051 20479	47R	5%	0,1W
3194	4822 051 20472	4k7	5%	0,1W
3196	4822 051 20008	CHIP JUMPER 0805		
3197	4822 051 20008	CHIP JUMPER 0805		
3198	4822 051 20103	10k	5%	0,1W
3200	4822 051 20008	CHIP JUMPER 0805		
3201	4822 051 20103	10k	5%	0,1W
3202	4822 051 20008	CHIP JUMPER 0805		
3223	4822 051 20474	470k	5%	0,1W

CHIP RESISTORS

3230	4822 051 20223	22k	5%	0,1W
3231	4822 051 20223	22k	5%	0,1W
3233	4822 051 10102	1k	2%	0,25W
3236	4822 051 20008	CHIP JUMPER 0805		
3239	4822 051 20274	270k	5%	0,1W
3240	4822 051 20472	4k7	5%	0,1W

CAPACITORS

2103	4822 124 40433	47µF	20%	25V
2104	4822 121 42408	220nF	5%	63V
2107	4822 122 31385	22pF	5%	50V
2114	5322 124 41431	22µF	20%	25V
2115	4822 124 40239	0,47µF	20%	63V
2116	5322 121 42386	100nF	5%	63V
2117	4822 121 41935	12nF	5%	250V
2118	4822 121 41935	12nF	5%	250V
2119	4822 124 40244	2,2µF	20%	63V
2120	4822 124 40244	2,2µF	20%	63V
2121	4822 124 40196	220µF	20%	16V
2123	4822 124 40246	4,7uF	20%	63V
2124	4822 124 40246	4,7uF	20%	63V
2129	4822 124 40242	1µF	20%	63V
2131	4822 124 40435	10µF	20%	50V
2142	4822 125 60102	30pF VARIABLE		
2144	4822 121 42408	220nF	5%	63V
2145	4822 121 51263	510pF	1%	400V
2146	4822 121 70082	430pF	1%	400V
2152	4822 124 40242	1µF	20%	63V
2156	4822 124 40433	47µF	20%	25V
2160	4822 124 41631	1,5µF	20%	50V
2162	4822 122 10166	22nF	30%	16V
2165	4822 124 40433	47µF	20%	25V
2193	4822 125 60102	30pF VARIABLE		
2194	4822 125 60101	10pF VARIABLE		
2210	4822 124 41643	100µF	20%	16V

CHIP CAPACITORS

2101	5322 122 34099	470pF	10%	63V
2102	5322 122 32268	470pF	10%	50V
2105	5322 122 32965	18pF	5%	50V
2108	5322 122 32654	22nF	10%	63V
2109	5322 122 32654	22nF	10%	63V
2110	5322 122 32654	22nF	10%	63V
2112	5322 122 32654	22nF	10%	63V
2113	5322 122 32661	56pF	5%	50V
2125	4822 122 33177	10nF	20%	50V
2126	4822 122 31782	15nF	10%	50V
2147	5322 122 32654	22nF	10%	63V
2148	5322 122 32452	47pF	5%	50V
2149	4822 122 33177	10nF	20%	50V
2150	5322 122 32654	22nF	10%	63V
2151	5322 122 34099	470pF	10%	63V
2153	5322 122 34099	470pF	10%	63V
2154	5322 122 32481	15pF	5%	50V
2155	5322 122 32965	18pF	5%	50V
2158	5322 126 10223	4,7nF	10%	63V
2159	5322 126 10223	4,7nF	10%	63V
2161	4822 122 32927	220nF	10%	63V
2195	4822 126 10004	120pF	5%	63V
2196	5322 122 32448	10pF	5%	50V
2215	5322 122 32268	470pF	10%	50V
2216	5322 122 32268	470pF	10%	50V

CHIP CAPACITORS

2219	4822 122 32927	220nF	10%	63V
2221	5322 122 32268	470pF	10%	50V
2224	4822 122 33575	220pF	5%	50V
2225	4822 122 33575	220pF	5%	50V

CD BOARD

MISCELLANEOUS

1020	4822 071 51601	FUSE 160mA
1021	4822 071 51601	FUSE 160mA
1250	4822 267 30933	SOCKET CHINCH

DIODES

6103	4822 130 30621	1N4148
6550	4822 130 31981	BZX79-C3V9
6660	4822 130 34173	BZX79-C5V6

TRANSISTORS

7040	4822 130 60887	BF840
7041	5322 130 41982	BC848 (CHIP)
7042	5322 130 41983	BC858B(CHIP)
7043	5322 130 41982	BC848 (CHIP)
7044	5322 130 41982	BC848 (CHIP)
7140	5322 130 42012	BC858 (CHIP)
7141	4822 130 61207	BC848 (CHIP)
7360	4822 130 42804	BC817-25 (CHIP)
7361	4822 130 42804	BC817-25 (CHIP)
7362	5322 130 42012	BC858 (CHIP)
7550	5322 130 42012	BC858 (CHIP)

INTEGRATED CIRCUITS

7000	4822 209 31064	TDA1301T/N1
7060	4822 209 72587	TCA372DP2
7080	4822 209 72587	TCA372DP2
7101	4822 209 63925	FCB61C65L-70T
7102	4822 209 30388	SAA7341GP
7300	4822 209 83274	NJM4560D
7301	4822 209 83274	NJM4560D
7500	4822 209 80891	MC7805CT
7660	4822 209 72587	TCA372DP2
7700	4822 900 10318	MC68HC05C8/SERVO-S17

COILS

1002	4822 242 73557	CERAMIC RES. 8,46MHz
1570	4822 242 81151	X-TAL 16,934MHz
1700	4822 242 72527	CERAMIC RES. 4.0 MHz
5250	4822 148 80281	COIL 100µH

RESISTORS

3000	4822 050 21003	10k	2%	0,25W
3001	4822 050 21003	10k	2%	0,25W
3002	4822 050 21003	10k	2%	0,25W
3003	4822 050 21003	10k	2%	0,25W
3004	4822 050 21003	10k	2%	0,25W
3005	4822 050 21003	10k	2%	0,25W
3007	4822 052 10338	3R3	NFR25	
3008	4822 052 10338	3R3	NFR25	
3014	4822 052 10478	4R7	5%	NFR
3015	4822 050 21002	1k	1%	0,6W
3016	4822 050 21002	1k	1%	0,6W
3049	4822 050 24301	430R	1%	0,6W
3056	4822 050 21204	120k	1%	0,6W
3057	4822 050 25603	56k	1%	0,6W
3058	4822 050 21002	1k	1%	0,6W
3062	4822 116 52244	15k	5%	0,5W
3064	4822 050 21503	15k	1%	0,6W
3065	4822 052 10229	22R	5%	0,33W
3066	4822 052 10108	1R	5%	0,33W
3067	4822 052 10108	1R	5%	0,33W

RESISTORS

3072	4822 050 26802	6k8	1%	0,6W
3073	4822 052 10229	22R	5%	0,33W
3074	4822 116 52244	15k	5%	0,5W
3075	4822 050 21003	10k	2%	0,25W
3081	4822 050 24702	4k7	1%	0,6W
3083	4822 052 10108	1R	5%	0,33W
3084	4822 052 10108	1R	5%	0,33W
3085	4822 050 21003	10k	2%	0,25W
3086	4822 052 10229	22R	5%	0,33W
3087	4822 116 52244	15k	5%	0,5W
3100	4822 050 22202	2k2	1%	0,6W
3103	4822 052 10338	3R3	NFR25	
3105	4822 052 10338	3R3	NFR25	
3111	4822 052 10229	22R	5%	0,33W
3112	4822 050 22205	2M2	1%	0,6W
3140	4822 116 52234	100k	5%	0,5W
3142	4822 050 24703	47k	1%	0,6W
3143	4822 052 10229	22R	5%	0,33W
3146	4822 050 21003	10k	2%	0,25W
3305	4822 052 10229	22R	5%	0,33W
3306	4822 052 10229	22R	5%	0,33W
3312	4822 050 22203	22k	1%	0,6W
3314	4822 050 21002	1k	1%	0,6W
3315	4822 050 21002	1k	1%	0,6W
3501	4822 052 10108	1R	5%	0,33W
3502	4822 052 10108	1R	5%	0,33W
3611	4822 116 52303	8k2	5%	0,5W
3615	4822 052 10108	1R	5%	0,33W
3616	4822 052 10108	1R	5%	0,33W
3617	4822 052 10229	22R	5%	0,33W
3701	4822 052 10338	3R3	NFR25	

CHIP RESISTORS

3006	4822 051 20103	10k	5%	0,1W
3009	4822 051 20105	1M	5%	0,1W
3010	4822 051 20103	10k	5%	0,1W
3011	4822 051 20103	10k	5%	0,1W
3012	4822 051 10102	1k	2%	0,25W
3013	4822 051 10102	1k	2%	0,25W
3017	4822 051 10102	1k	2%	0,25W
3040	4822 051 10101	100R	5%	0,125W
3041	4822 051 20393	39k	5%	0,1W
3042	4822 051 20334	330k	5%	0,1W
3043	4822 051 20303	30k	5%	0,1W
3044	4822 051 10102	1k	2%	0,25W
3045	4822 051 20101	100R	5%	0,1W
3046	4822 051 10102	1k	2%	0,25W
3047	4822 051 20434	430k	5%	0,1W
3048	4822 051 20101	100R	5%	0,1W
3050	4822 051 20434	430k	5%	0,1W
3051	4822 051 20182	1k8	5%	0,1W
3052	4822 051 20182	1k8	5%	0,1W
3053	4822 051 20392	3k9	5%	0,1W
3054	4822 051 20101	100R	5%	0,1W
3055	4822 051 20124	120k	5%	0,1W
3060	4822 117 10036	7k5	1%	0,1W
3061	4822 051 20682	6k8	5%	0,1W
3063	4822 051 20103	10k	5%	0,1W

CHIP RESISTORS

3070	4822 051 20153	15k	5%	0,1W
3071	4822 051 20103	10k	5%	0,1W
3080	4822 051 20682	6k8	5%	0,1W
3082	4822 051 20153	15k	5%	0,1W
3101	4822 051 20223	22k	5%	0,1W
3102	4822 051 20223	22k	5%	0,1W
3106	4822 051 10102	1k	2%	0,25W
3109	4822 051 20222	2k2	5%	0,1W
3110	4822 051 20105	1M	5%	0,1W
3117	4822 051 20182	1k8	5%	0,1W
3118	4822 051 20182	1k8	5%	0,1W
3119	4822 051 10561	560R	2%	0,25W
3141	4822 051 20104	100k	5%	0,1W
3144	4822 051 20223	22k	5%	0,1W
3147	4822 051 20392	3k9	5%	0,1W
3148	4822 051 20473	47k	5%	0,1W
3255	4822 051 10561	560R	2%	0,25W
3256	4822 051 20621	620R	5%	0,1W
3300	4822 051 20104	100k	5%	0,1W
3301	4822 051 20273	27k	5%	0,1W
3302	4822 051 20332	3k3	5%	0,1W
3303	4822 051 20123	12k	2%	0,1W
3304	4822 051 20123	12k	2%	0,1W
3307	4822 051 20332	3k3	5%	0,1W
3308	4822 051 20123	12k	2%	0,1W
3309	4822 051 20104	100k	5%	0,1W
3310	4822 051 20273	27k	5%	0,1W
3311	4822 051 20123	12k	2%	0,1W
3313	4822 051 20223	22k	5%	0,1W
3320	4822 116 83933	15k	1%	0,1W
3321	4822 116 83933	15k	1%	0,1W
3322	4822 116 83933	15k	1%	0,1W
3323	4822 116 83933	15k	1%	0,1W
3325	4822 116 83933	15k	1%	0,1W
3326	4822 116 83933	15k	1%	0,1W
3327	4822 116 83933	15k	1%	0,1W
3328	4822 116 83933	15k	1%	0,1W
3360	4822 051 10102	1k	2%	0,25W
3361	4822 051 10102	1k	2%	0,25W
3550	4822 051 20561	560R	5%	0,1W
3551	4822 051 10102	1k	2%	0,25W
3552	4822 051 20223	22k	5%	0,1W
3553	4822 051 10102	1k	2%	0,25W
3610	4822 051 20123	12k	2%	0,1W
3612	4822 051 20123	12k	2%	0,1W
3613	4822 051 20123	12k	2%	0,1W
3614	4822 051 20123	12k	2%	0,1W
3662	4822 051 20103	10k	5%	0,1W
3663	4822 051 20103	10k	5%	0,1W
3664	4822 051 20103	10k	5%	0,1W
3665	4822 051 20561	560R	5%	0,1W
3700	4822 051 20224	220k	5%	0,1W
3706	4822 051 20103	10k	5%	0,1W
3707	4822 051 20103	10k	5%	0,1W
3708	4822 051 20103	10k	5%	0,1W
3710	4822 051 20103	10k	5%	0,1W
3711	4822 051 20332	3k3	5%	0,1W
3713	4822 051 20103	10k	5%	0,1W
3714	4822 051 20103	10k	5%	0,1W
3715	4822 051 20332	3k3	5%	0,1W
3716	4822 051 20103	10k	5%	0,1W
3717	4822 051 20103	10k	5%	0,1W
3718	4822 051 20103	10k	5%	0,1W
3719	4822 051 20103	10k	5%	0,1W
3720	4822 051 20103	10k	5%	0,1W

CHIP RESISTORS

3721	4822 051 20103	10k	5%	0,1W
3722	4822 051 10102	1k	2%	0,25W
3723	4822 051 10102	1k	2%	0,25W
3724	4822 051 10102	1k	2%	0,25W
4000	4822 051 10008	CHIP JUMPER 1206		
4001	4822 051 10008	CHIP JUMPER 1206		
4002	4822 051 10008	CHIP JUMPER 1206		
4003	4822 051 10008	CHIP JUMPER 1206		
4004	4822 051 10008	CHIP JUMPER 1206		
4104	4822 051 10008	CHIP JUMPER 1206		
4105	4822 051 10008	CHIP JUMPER 1206		
4106	4822 051 10008	CHIP JUMPER 1206		
4107	4822 051 10008	CHIP JUMPER 1206		
4108	4822 051 10008	CHIP JUMPER 1206		
4109	4822 051 10008	CHIP JUMPER 1206		
4200	4822 051 10008	CHIP JUMPER 1206		
4302	4822 051 10008	CHIP JUMPER 1206		
4600	4822 051 10008	CHIP JUMPER 1206		
4700	4822 051 10008	CHIP JUMPER 1206		
4701	4822 051 10008	CHIP JUMPER 1206		

CAPACITORS

2010	5322 124 21643	22μF	20%	40V
2012	4822 124 40272	33μF	20%	16V
2015	5322 124 21643	22μF	20%	40V
2017	5322 124 21643	22μF	20%	40V
2042	5322 124 21643	22μF	20%	40V
2052	5322 124 21643	22μF	20%	40V
2062	4822 124 40272	33μF	20%	16V
2063	4822 124 40272	33μF	20%	16V
2081	5322 124 21643	22μF	20%	40V
2083	5322 124 21643	22μF	20%	40V
2103	4822 124 40849	330μF	20%	16V
2105	5322 121 42661	330nF	5%	63V
2107	4822 124 41584	100μF	20%	10V
2109	4822 124 40242	1μF	20%	63V
2111	5322 121 42386	100nF	5%	63V
2116	4822 124 40242	1μF	20%	63V
2119	4822 124 41584	100μF	20%	10V
2122	4822 124 40849	330μF	20%	16V
2301	4822 124 40272	33μF	20%	16V
2302	4822 124 40246	4,7uF	20%	63V
2304	4822 124 40272	33μF	20%	16V
2305	4822 124 40246	4,7uF	20%	63V
2311	4822 124 40246	4,7uF	20%	63V
2500	4822 124 80148	2200μF	20%	16V
2502	4822 124 41853	1000μF	20%	16V
2702	4822 124 40272	33μF	20%	16V

CHIP CAPACITORS

2000	5322 122 31865	1,5nF	10%	63V
2001	5322 116 80853	560pF	5%	63V
2003	4822 122 32575	220pF	10%	500V
2004	4822 122 32575	220pF	10%	500V
2005	4822 122 32575	220pF	10%	500V
2006	4822 122 32575	220pF	10%	500V
2007	4822 122 32575	220pF	10%	500V
2008	4822 122 32575	220pF	10%	500V
2009	4822 122 33496	100nF	10%	63V
2011	4822 122 33496	100nF	10%	63V
2016	4822 122 33496	100nF	10%	63V
2018	4822 122 33496	100nF	10%	63V
2019	4822 122 33809	22nF	20%	
2040	5322 122 32654	22nF	10%	63V
2041	4822 126 10326	180pF	5%	

CHIP CAPACITORS

2043	5322 122 31863	330pF	5%	50V
2044	4822 126 10326	180pF	5%	
2045	5322 122 32452	47pF	5%	50V
2046	5322 122 32452	47pF	5%	50V
2047	5322 122 32531	100pF	5%	50V
2048	5322 122 32965	18pF	5%	50V
2049	4822 126 10326	180pF	5%	
2050	4822 126 10326	180pF	5%	
2051	5322 122 31863	330pF	5%	50V
2060	4822 122 33496	100nF	10%	63V
2061	4822 122 33496	100nF	10%	63V
2064	4822 122 33342	33nF	10%	63V
2065	4822 122 33496	100nF	10%	63V
2066	4822 122 33175	2,2nF	20%	50V
2070	4822 122 33176	2,7nF	20%	50V
2071	4822 122 33496	100nF	10%	63V
2072	4822 126 10326	180pF	5%	
2080	4822 122 33496	100nF	10%	63V
2082	4822 122 33496	100nF	10%	63V
2084	4822 126 10326	180pF	5%	
2085	4822 122 33496	100nF	10%	63V
2086	5322 126 10465	3,9nF	10%	63V
2101	5322 122 32452	47pF	5%	50V
2102	4822 122 33175	2,2nF	20%	50V
2104	4822 122 33496	100nF	10%	63V
2106	4822 122 33496	100nF	10%	63V
2108	4822 122 33809	22nF	20%	
2110	5322 122 32659	33pF	5%	50V
2112	4822 122 33496	100nF	10%	63V
2114	5322 122 32452	47pF	5%	50V
2115	5322 122 32452	47pF	5%	50V
2117	5322 126 10223	4,7nF	10%	63V
2118	5322 126 10223	4,7nF	10%	63V
2120	4822 122 33496	100nF	10%	63V
2121	4822 122 33496	100nF	10%	63V
2123	4822 122 33496	100nF	10%	63V
2125	5322 126 10223	4,7nF	10%	63V
2140	4822 122 33496	100nF	10%	63V
2141	4822 122 32542	47nF	10%	63V
2253	4822 122 33105	56nF	10%	63V
2300	5322 116 80853	560pF	5%	63V
2303	4822 122 33216	270pF	5%	50V
2306	4822 122 33496	100nF	10%	63V
2309	4822 122 33216	270pF	5%	50V
2310	5322 116 80853	560pF	5%	63V
2312	4822 122 33219	1,8nF	10%	50V
2313	4822 122 33219	1,8nF	10%	50V
2501	4822 122 33496	100nF	10%	63V
2503	4822 122 33496	100nF	10%	63V
2504	4822 122 33496	100nF	10%	63V
2550	4822 122 33175	2,2nF	20%	50V
2610	4822 122 33496	100nF	10%	63V
2611	4822 122 33496	100nF	10%	63V
2612	4822 122 33496	100nF	10%	63V
2703	4822 122 33809	22nF	20%	
2704	4822 122 33175	2,2nF	20%	50V

ACCESSORIES

4822 321 10831	AC CORD /20, /21, /22
4822 321 10918	AC CORD /25
4822 321 10954	AC CORD /30
4822 321 10883	AC CORD /37
4822 218 10513	IR REMOTE CONTROL
4822 445 10359	SPEAKER /20,/22,/25
4822 445 10361	SPEAKER/37
4822 445 10362	SPEAKER/21
4822 321 10831	SPEAKER/30

4130

AS440, AS445

A93-365

Service
Service
Service

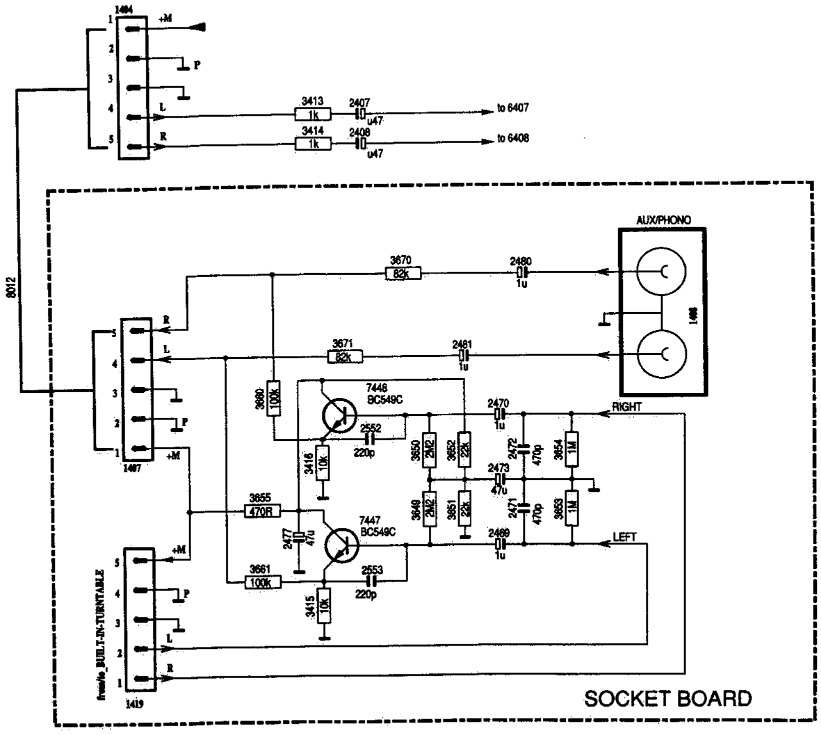
Product Service Group CE Audio

Service Information

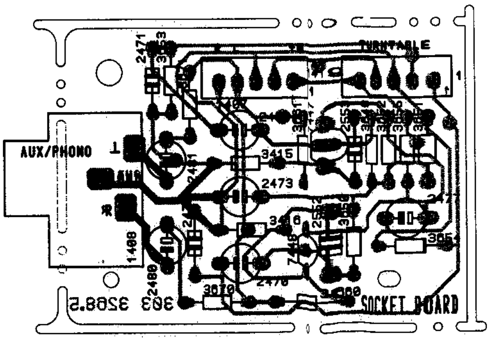
Already published Service Informations: *A93-358 (4822 725 24906)*

Fault: Playback of a record isn´t possible if an external source is connected to the AUX/PHONO socket (1408). **Only valid for sets with internal record player.**

Therefore the circuit diagram and the component layout have been changed from production week 9344 onwards.


1404
+M
P
L
R
3413
1k
2407
u47
to 6407
3414
1k
2408
u47
to 6408
8012
AUX/PHONO
1408
3670
82k
2480
1u
3671
82k
2481
1u
1407
3660
100k
7448
BC549C
2552
220p
3416
10k
3650
2M2
3652
22k
2470
1u
2472
470p
3654
1M
RIGHT
2473
47u
3655
470R
3649
2M2
3651
22k
2471
470p
3653
1M
2477
47u
7447
BC549C
2469
1u
LEFT
3661
100k
2553
220p
3415
10k
from/to BUILT-IN-TURNTABLE
1419
SOCKET BOARD

Component side view


TURNTABLE
AUX/PHONO
1408
2471
3415
2473
2480
3670
SOCKET BOARD
303 3268.5

Capacitors 2480 and 2481(1μF) have been added.	Service code **4822 124 40242**.
Resistors 3413 and 3414 have been changed to 1kΩ.	Service code **4822 050 11002**.
Resistors 3660 and 3661 have been changed to 100kΩ.	Service code **4822 116 52234**.
Resistors 3670 and 3671(82kΩ) have been added.	Service code **4822 116 52304**.

Suppl

AS440

A93-358

Service
Service
Service

Product Service Group CE Audio

Service Information

New sets have been introduced!

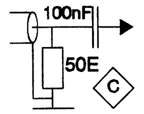
For Service the set

AS440/20H is equal to **AS440/20** but different production center.
AS440/22H is equal to **AS440/22** but different production center.
AS440/25H is equal to **AS440/25** but different production center.

1993-06-17

(GB) 4822 725 24906

TUNER Adjustment table (**ECO 4** FM/MW- and FM/MW/LW - versions with AM-ferrite antenna)

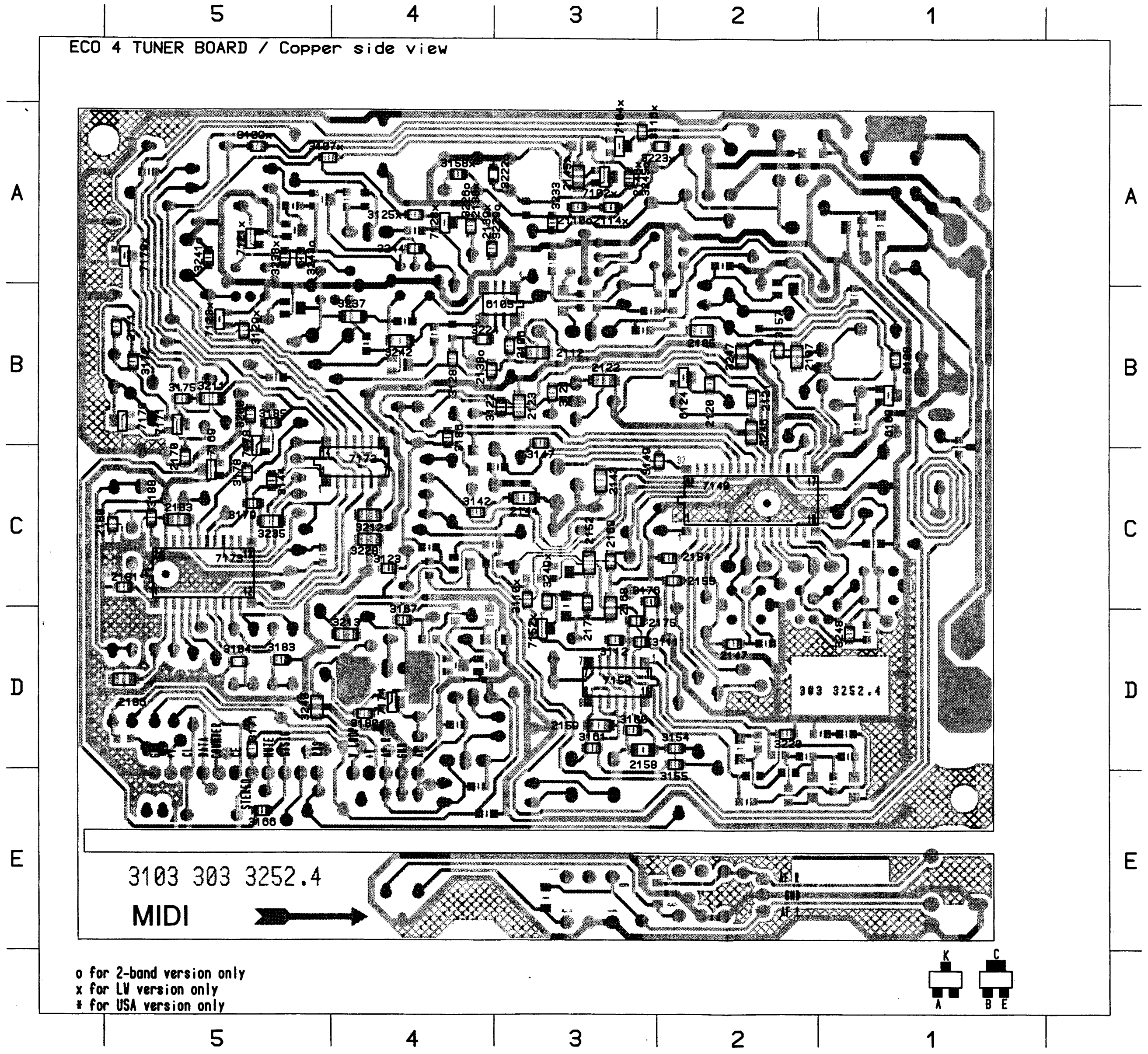
Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT *1)						
FM 87.5 - 108MHz			108 MHz	5120	◇1	8V ± 0.2V
			87.5MHz	check		4.1V ± 0.5V
FM /14 East Europe 65.81 - 108MHz			108 MHz	5120		8V ± 0.2V
			65.81 MHz	check		0.8V ± 0.4V
MW 2-band version, 10kHz grid 530 - 1710kHz			1710kHz	5123		9V±0.1V (7.5±0.7V)[1]
			530kHz	check		1V±0.4V (1.1±0.5V)[1]
LW 153 - 279kHz			279kHz	5122		8V±0.2V (7.5±1.5V)[1]
			153kHz	check		1V±0.4V (1.1±0.5V)[1]
MW 3-band version 522 - 1611kHz			1611kHz	5123		8V±0.1V (7.5±0.5V)[1]
			522kHz	check		1V±0.4V (1.1±0.5V)[1]
FM - RF						
FM	108MHz	◇A mod=1kHz Δf=22.5kHz	108MHz	2115	◇3	MAX ↕
	87.5MHz		87.5MHz	5109		
FM /14 East Europe	108MHz		108MHz	2115		
	65.81MHz		65.81MHz	5109		
VCO						
FM	98 MHz, 1mV continuous wave	◇A	98MHz	3148	◇2	152kHz ± 1kHz
AM - IF						
MW	540kHz Δf = 10kHz as low as possible		540kHz	5142 5140	◇4	symmetrical and max height
AM - RF						
LW	198kHz	◇B mod=1kHz 30% AM	198kHz	5122	◇4	MAX
MW 3-band version	1494kHz		1494kHz	2130		MAX ↕
	549kHz		549kHz	5123		
MW 2-band version, 10kHz grid	1500kHz		1500kHz	2130		
	550kHz		550kHz	5123		

* Use Service Test Program. By selecting the TUNER TEST, test frequencies will be stored as preset frequ. automatically.

[1] Adjustment of AM-RF stage influences the varicap voltage. Therefore check if varicap voltage fulfils value stated within brackets after AM-RF adjustment.

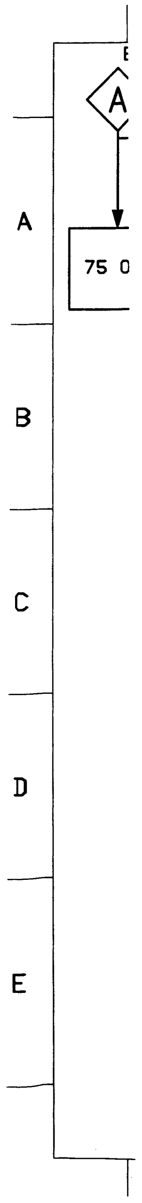
Component layout

2107 B 2
2110o A 3
2112 B 3
2114x A 3
2120 B 2
2121 B 2
2122 B 3
2123 B 3
2133x A 4
2138o B 4
2139x A 4
2143 C 3
2144 C 3
2145x A 3
2146x A 3
2147 D 2
2152 C 3
2154 C 2
2155 C 2
2158 D 3
2159 D 3
2168 D 3
2169 C 3
2170 C 5
2171 B 5
2174 C 3
2175 D 3
2180 C 5
2181 C 5
2183 C 5
2185 B 2
2186 D 5
3106 B 3
3107x A 5
3108 B 1
3109x A 5
3110x C 3
3111 D 3
3112 D 3
3116x A 3
3121 B 3
3122 B 3
3123 C 4
3125x A 4
3128 B 4
3129x B 5
3142 C 4
3144 C 5
3147 B 3
3149 C 2
3154 D 2
3155 D 2
3157 B 2
3158x A 4
3160 D 3
3161 D 3
3166 E 5
3167 D 4
3171 D 5
3172 B 5
3175 B 5
3176 C 3
3178 C 5
3179 C 5
3180 D 4
3183 D 5
3184 D 5
3185 B 5
3186 B 4
3188 C 5
3200 B 5
3211 B 5
3212 C 4
3213 D 4
3220 D 2
3222o A 3
3223x A 2
3224 B 4
3226o A 4
3228 C 4
3229o A 4
3233 A 3
3235 C 5
3237 B 4
3238x A 5
3240 D 5
3241o A 5
3242 B 4
3243o A 5
3244 A 4
3245o A 3
3246 B 2
3247 B 2
3248 D 1
3249x C 3
6105 B 3
6109 B 1
6124 B 2
7102x A 3
7104x A 3
7121x A 5
7123x B 5
7128x A 4
7140 C 2
7150 D 3
7152x D 3
7169 C 5
7170 B 5
7171 B 5
7172 C 4
7173 C 5
7174 D 4
7178 C 5
7179x A 5
T001 A 1
T002 A 1
T005 D 1
T007 C 2
T008 D 1
T009 B 2
T010 C 3
T011 C 3
T012 C 2
T013 D 2
T014 D 2
T015 B 5
T016 A 5
T020 E 4
T021 D 3
T022 D 4
T023 D 4
T027 E 5
T028 E 5
T029 D 5
T030 D 5
T031 E 5
T032 E 5
T033 D 5
T036 B 5
T038 D 5
T040 B 4



o for 2-band version only
x for LW version only
* for USA version only

1101 A 1
1153 E 4
1173 E 5
2100 A 1
2104 C 1
2115 B 1
2124 B 4
2129x B 5
2130 B 4



Supl.

Survey of changes - ECO 4 tuner board

Introduction date	Change	Service Code	Reason
Wk 9333	3148 from 47k to 100k	4822 100 11163	to ease VCO adjustment
	3149 from 68k to 56k	4822 051 20563	
	3186 from 47k to 100k	-	increase of search sensitivity (back to normal level)
	3112 from 27k to 22k	-	reduction of distortion in STEREO mode
Wk 9328	3112 from 22k to 24k	-	to adapt STEREO switching level
Wk 9329	7140 from TEA5712T/**N1** to TEA5712T/**N2**		
	pcb from stage **.3** to stage **.4**		adaptions for TEA5712T/**N2**
	3112 from 24k to 22k	4822 051 20223	
	3157 from 47k to 27k	4822 051 20273	
	3159 from 10k to 180k	4822 051 20184	
	2193 100nF added	4822 122 33496	"search sensitivity circuit" changed because of TEA5712T/**N2**
	3178 from 100k to 3k3	4822 051 20332	
	3179 from 22k to 27k	-	
	3185 from 100k to 4k7	4822 051 20472	
	3186 from 100k to 18k	4822 051 20183	
	3200 22k added	4822 051 20223	
	3235 chip jumper 1206 added	4822 051 90010	
	7169 from BC858B to BC848C	5822 130 42136	
Wk 9335	2154 from 2n2 to 10n	4822 122 33177	reduction of total harmonic distortion
	(USA /17) 15n	4822 122 33128	
	2155 from 2n2 to 10n	4822 122 33177	
	(USA /17) 15n	4822 122 33128	
	2158 from 1n to 180p	4822 122 31768	
	(USA/17)680p to 180p	4822 122 31768	
	2159 from 1n to 180p	4822 122 31768	
	(USA/17)680p to 180p	4822 122 31768	
	5171 coil changed to resistor 3198, 10R		improve S/N on LW 153kHz
Wk 9334	3179 from 27k to 100k	4822 051 20104	to increase FM search sensitivity
Wk 9350	cancellation of MUTE circuit		
Wk 9348	2133 from 10n to 15n	4822 122 33128	to improve PLL behaviour when jumping the whole frequency range on LW from 150kHz to 279kHz
	2138 from 22p to 33p	4822 122 32659	
	2139 from 2n7 to 3n3	4822 122 33891	
	3128 from 2k2 to 10k	4822 051 20103	
	3193 from 470R to 2k2	4822 116 52249	

- For reasons of standardisations the headphone socket has been changed to **4822 267 40659**.
  Introduction date: Week 9336.

- To reduce residual noise the value of the motorpot has been changed to 50kΩ. (**4822 101 90248**)
  Introduction date: Week 9336.

- To iprove frequency response of the *Power Board*, capacitors 2323 and 2324 have been changed to 1n5 (**4822 126 12878**).
  Introduction date: Week 9332.

- To increase the input level for the *Recorder Board*, resistors 3437 and 3438 have been changed to 18kΩ. (**4822 116 52264**)
  Introduction date: Week 9332.

- **Fault:** "Ticking noise" is audible during record from CD.

  Solution: Following changes have been done on the *Front Board*.

Resistors 3405,3406 have been changed to 3k9.	Service code **4822 116 52276**.
Resistors 3437,3438 have been changed to 3k9.	Service code **4822 116 52276**.
Resistors 3605,3606 have been changed to 1k0.	Service code **4822 050 11002**.
Resistor 3609 has been changed to 1k0.	Service code **4822 050 11002**.
Resistors 3607,3608 have been changed to 1k0.	Service code **4822 050 11002**.
Resistors 3407,3408 have been changed to 270Ω.	Service code **4822 116 52217**.
Capacitor 2468 has been changed to 47µF.	Service code **4822 124 40433**.

  Introduction date: Week 9336.

- Correction to the Service Manual
  Dismantling hints - picture 6 on page 11.
  Colour of wires to the stand by LED has been interchanged from production start onwards.
  Correct is: long pin of LED connected to the grey wire
  short pin of LED connected to the black wire

- Due to cost reduction following changes have been done on the *Power Board*.
  Introduction date: Week 9336.
  - Capacitors 2325 and 2326 have been changed to 100µF. Service code **4822 124 41525**.
  - The complete ***switch on mute*** circuit has been deleted. (7350, 7351, 3351, 3352, 3353, 6352, 2357)
  - Resistor 3264 has been replaced by a wire bridge.

- Except for the /21, /22 and /30 versions
  - Coils 5309, 5311, 5312, 5315 and 5316 have been replaced by wire bridges.
  - Resistors 3323, 3324, 3325 and 3326 have been replaced by wire bridges too.
  - Capacitors 2266, 2267, 2321 and 2322 have been deleted.

  (These components are only necessary to fulfil FTZ requirements.)

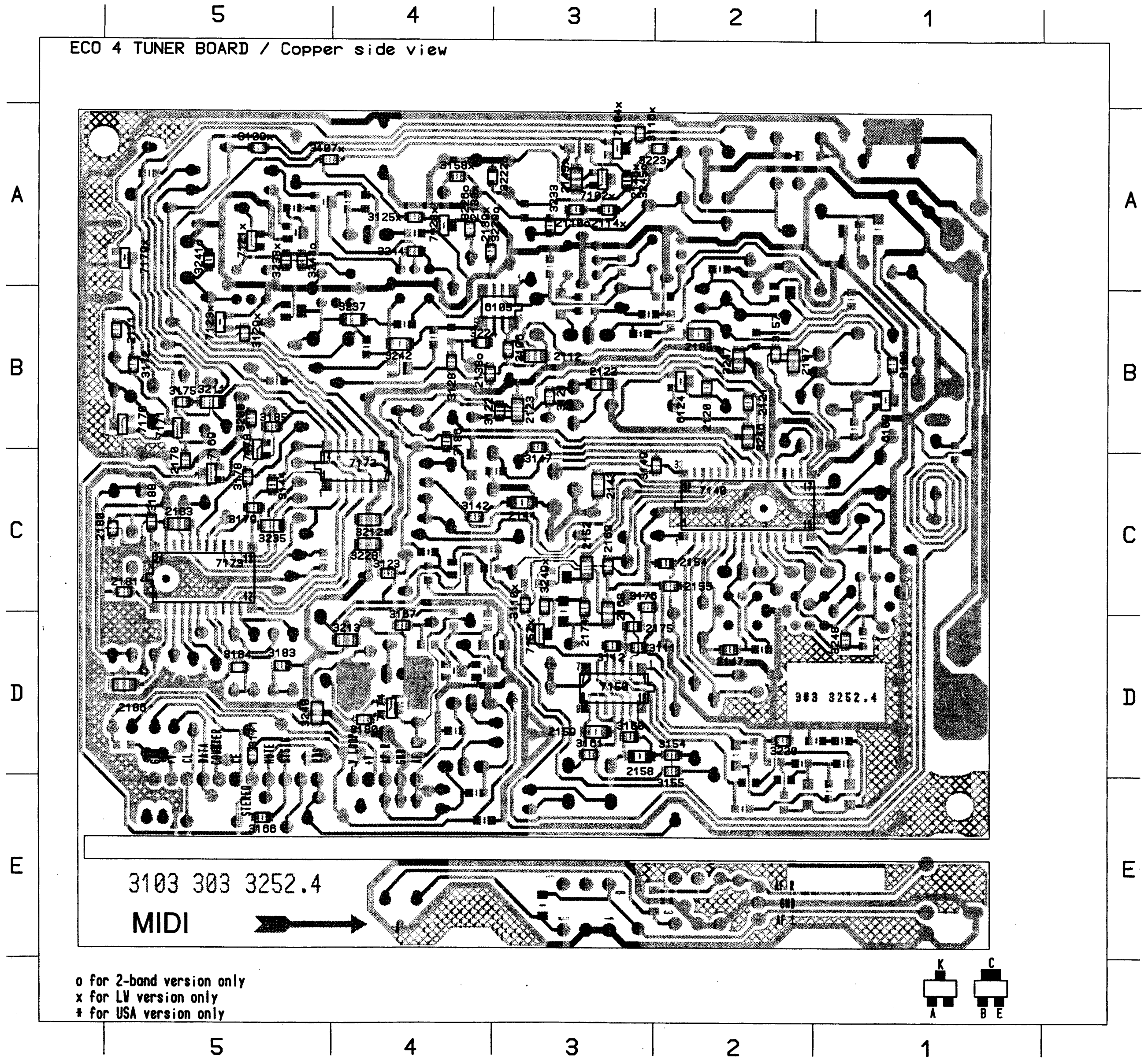
- Due to cost reduction pos. 501 (see exploded view of set) has been omitted. Therefore pos. 401 (side left) has been adapted.
  Introduction date: Week 9336.

/ Voltmeter
± 0.2V
/ ± 0.5V
± 0.2V
/ ± 0.4V
/ (7.5±0.7V)$^{1)}$
/ (1.1±0.5V)$^{1)}$
/ (7.5±1.5V)$^{1)}$
/ (1.1±0.5V)$^{1)}$
/ (7.5±0.5V)$^{1)}$
/ (1.1±0.5V)$^{1)}$
\X ↕
Hz ± 1kHz
ıetrical and x height
\X.
\X ↕

ɔmatically.
ed within

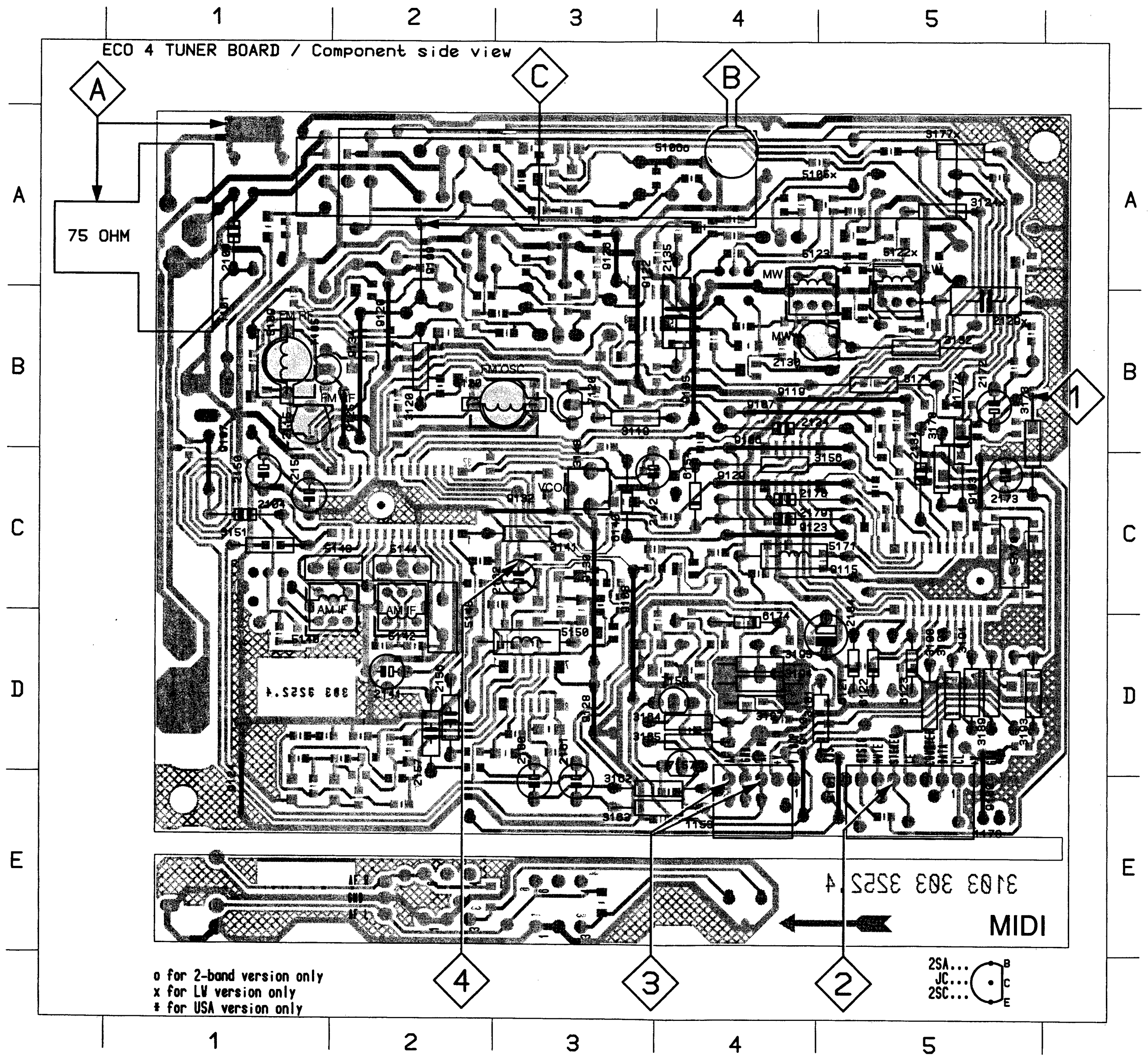
Component layout

2107 B 2	2144 C 3	2171 B 5	3110x C 3	3147 B 3	3175 B 5	3212 C 4	3238x A 5	6109 B 1	7171 B 5	T010 C 3	T028 E 5
2110o A 3	2145x A 3	2174 C 3	3111 D 3	3149 C 2	3176 C 3	3213 D 4	3240 D 5	6124 B 2	7172 C 4	T011 C 3	T029 D 5
2112 B 3	2146x A 3	2175 D 3	3112 D 3	3154 D 2	3178 C 5	3220 D 2	3241o A 5	7102x A 3	7173 C 5	T012 C 2	T030 D 5
2114x A 3	2147 D 2	2180 C 5	3116x A 3	3155 D 2	3179 C 5	3222o A 3	3242 B 4	7104x A 3	7174 D 4	T013 D 2	T031 E 5
2120 B 2	2152 C 3	2181 C 5	3121 B 3	3157 B 2	3180 D 4	3223x A 2	3243o A 5	7121x A 5	7178 C 5	T014 D 2	T032 E 5
2121 B 2	2154 C 2	2183 C 5	3122 B 3	3158x A 4	3183 D 5	3224 B 4	3244 A 4	7123x B 5	7179x A 5	T015 B 5	T033 D 5
2122 B 3	2155 C 2	2185 B 2	3123 C 4	3160 D 3	3184 D 5	3226o A 4	3245o A 3	7128x A 4	T001 A 1	T016 A 5	T036 B 5
2123 B 3	2158 D 3	2186 D 5	3125x A 4	3161 D 3	3185 B 5	3228 C 4	3246 B 2	7140 C 2	T002 A 1	T020 E 4	T038 D 5
2133x A 4	2159 D 3	3106 B 3	3128 B 4	3166 E 5	3186 B 4	3229o A 4	3247 B 2	7150 D 3	T005 D 1	T021 D 3	T040 B 4
2138o B 4	2168 D 3	3107x A 5	3129x B 5	3167 D 4	3188 C 5	3233 A 3	3248 D 1	7152x D 3	T007 C 2	T022 D 4	
2139x A 4	2169 C 3	3108 B 1	3142 C 4	3171 D 5	3200 B 5	3235 C 5	3249x C 3	7169 C 5	T008 D 1	T023 D 4	
2143 C 3	2170 C 5	3109x A 5	3144 C 5	3172 B 5	3211 B 5	3237 B 4	6105 B 3	7170 B 5	T009 B 2	T027 E 5	



o for 2-band version only
x for LW version only
* for USA version only

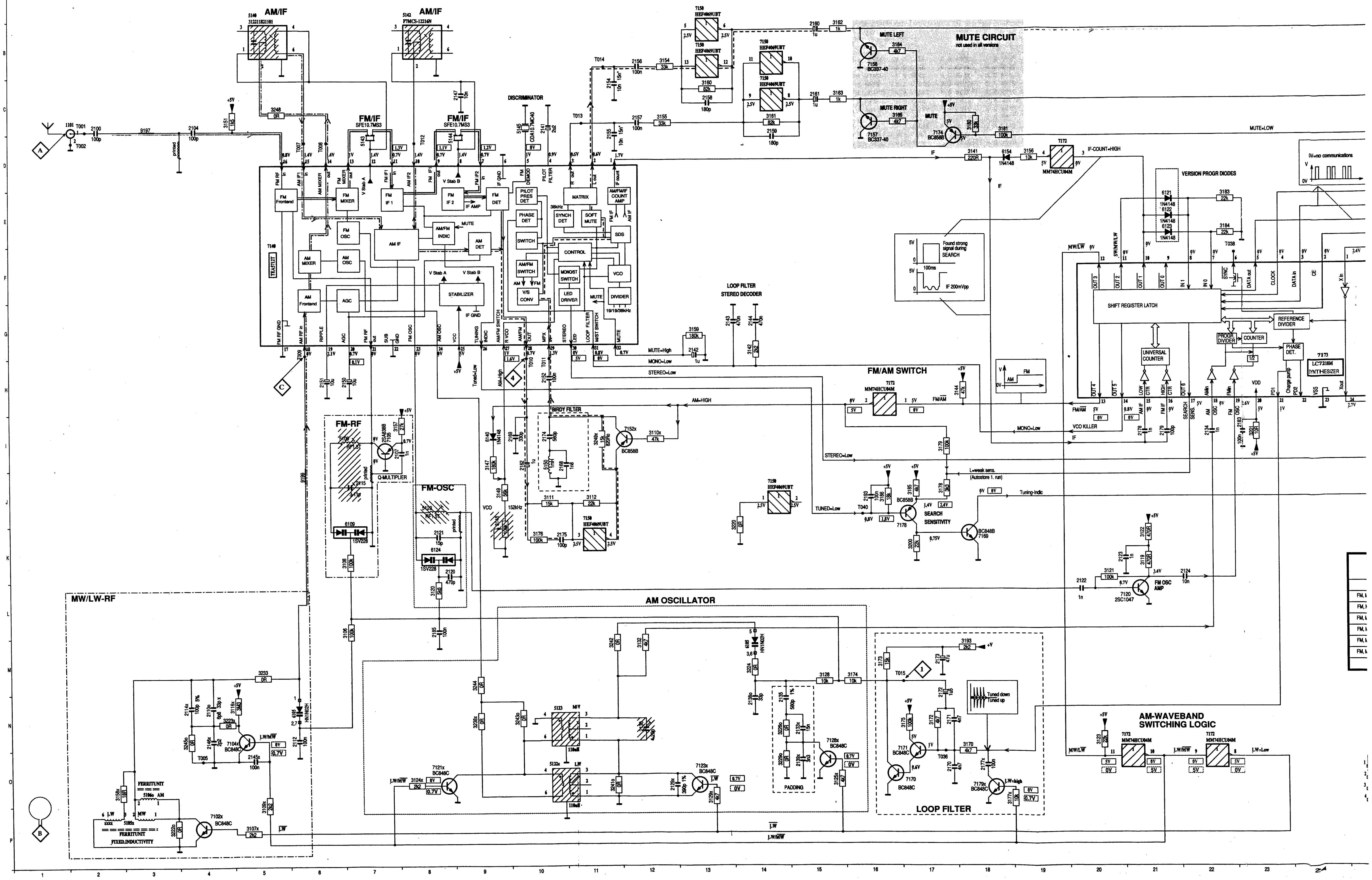
1101 A 1	2134 C 5	2161 E 3	3120 B 2	3164 D 4	3191 D 5	5120 B 3	5170 C 5	7120 B 3	9108 D 3	9126 A 3
1153 E 4	2135 B 4	2162 C 3	3124x A 5	3165 D 4	3192 D 5	5122x A 5	5171 C 4	7156 D 4	9110 E 4	9128 D 3
1173 E 5	2141 D 2	2172 B 5	3132 B 5	3170 C 5	3193 D 5	5123 B 4	6121 D 5	7157 D 4	9115 C 5	9129 C 4
2100 A 1	2142 C 3	2173 C 5	3141 C 3	3173 B 5	3194 D 4	5140 C 2	6122 D 5	9100 E 5	9119 B 5	9130 C 3
2104 C 1	2150 C 1	2177x B 5	3148 C 3	3174 B 5	3195 D 4	5142 C 2	6123 D 5	9101 E 5	9120 B 2	9132 C 3
2115 B 1	2151 C 1	2178 C 4	3151 C 1	3177x A 5	3197 D 4	5143 C 2	6140 C 3	9103 C 5	9122 B 3	9134 B 2
2124 B 4	2156 D 2	2179 C 4	3156 C 4	3181 D 5	5105x A 4	5144 C 2	6154 C 4	9105 B 4	9123 C 4	9197 C 1
2129x B 5	2157 D 2	2184 D 5	3162 E 4	3189 D 5	5106o A 4	5145 D 2	6174 D 4	9106 B 4	9124 E 1	9199 A 2
2130 B 4	2160 E 3	3119 B 3	3163 E 4	3190 D 5	5109 B 1	5150 D 3	7105 B 1	9107 B 4	9125 B 2	



o for 2-band version only
x for LW version only
* for USA version only

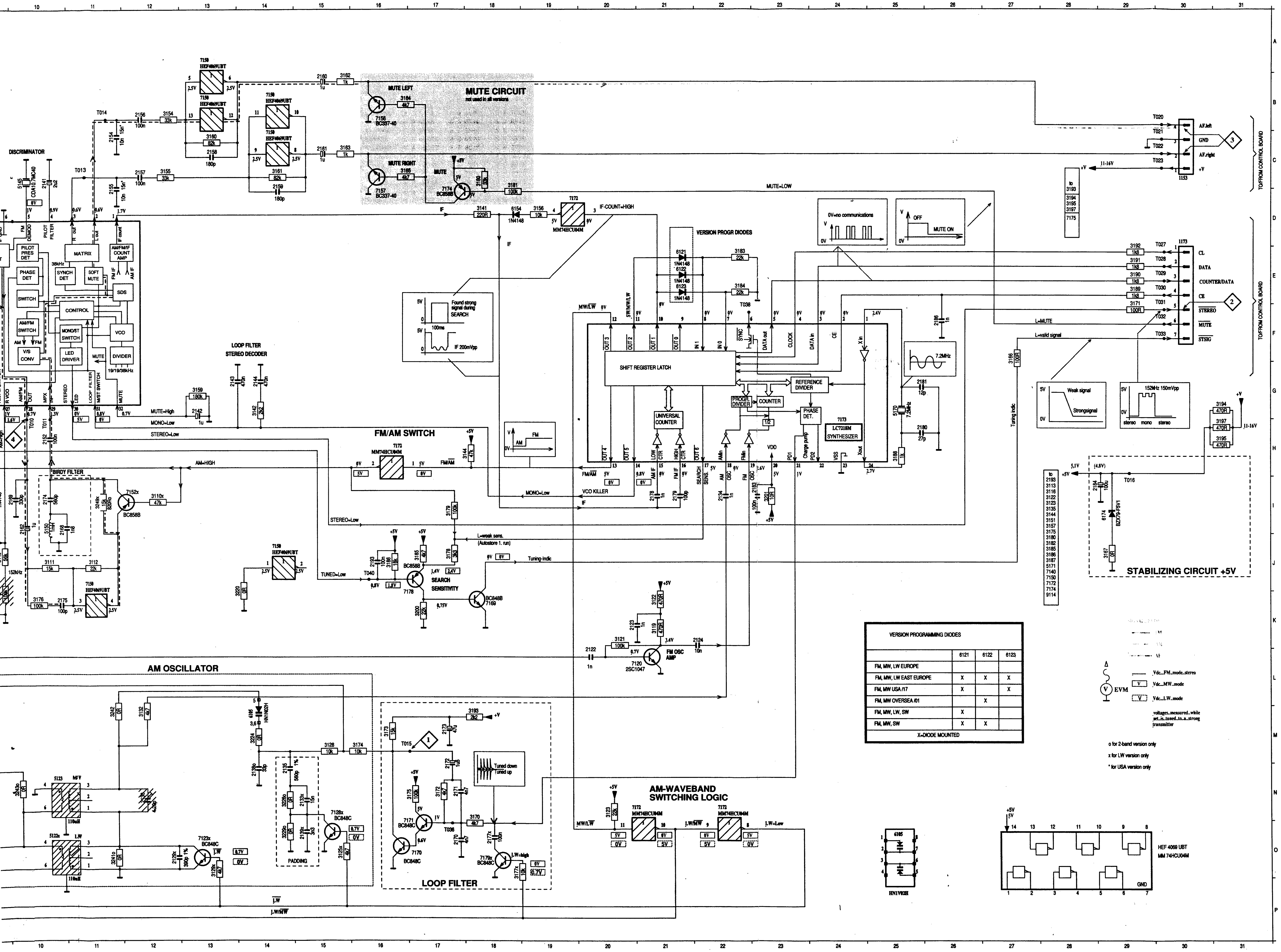
sypl

TUNER UNIT ECO4 (MIDI)


AM/IF
5140
312211821101
AM/IF
5142
F7MCS-12216N
FM/IF
SFE10.7MS3
FM/IF
SFE10.7MS3
DISCRIMINATOR
CDA10.7MC40
7140
TEA5712T
FM Frontend
FM MIXER
FM IF 1
FM IF 2
IF AMP
FM DET
FM OSC
AM IF
AM/FM INDIC
AM DET
AM MIXER
AM OSC
AM Frontend
AGC
STABILIZER
PILOT PRES DET
PHASE DET
SWITCH
AM/FM SWITCH
V/S CONV
MATRIX
SYNCH DET
SOFT MUTE
AM/FM/IF COUNT AMP
SDS
CONTROL
MONO/ST SWITCH
LED DRIVER
VCO
DIVIDER
19/19/38kHz
MUTE
7150
HEF4069UBT
MUTE CIRCUIT
not used in all versions
MUTE LEFT
MUTE RIGHT
7158
BC337-40
7157
BC337-40
7174
BC858B
MUTE=LOW
IF-COUNT=HIGH
7172
MM74HCU04M
VERSION PROGR DIODES
6121
6122
6123
1N4148
0V=no communications
Found strong signal during SEARCH
100ms
IF 200mVpp
SHIFT REGISTER LATCH
REFERENCE DIVIDER
PROGR. DIVIDER
COUNTER
UNIVERSAL COUNTER
PHASE DET.
7173
LC7218M
SYNTHESIZER
LOOP FILTER
STEREO DECODER
FM/AM SWITCH
MUTE=High
MONO=Low
STEREO=Low
AM=HIGH
BIRDY FILTER
7152x
BC858B
FM-RF
5109
2SA838B
Q-MULTIPLIER
6109
1SV228
FM-OSC
5129
6124
1SV228
VCO
152kHz
L=weak sens. (Autostore 1. run)
Tuning-Indic
TUNED=Low
7178
BC858B
SEARCH SENSITIVITY
BC848B
7169
FM OSC AMP
7120
2SC1047
MW/LW-RF
FERRITUNIT
5186x
FIXED INDUCTIVITY
7102x
BC848C
7104x
BC848C
AM OSCILLATOR
5123
5122x
7121x
BC848C
7123x
BC848C
7128x
BC848C
PADDING
LOOP FILTER
Tuned down
Tuned up
7171
BC848C
7170
BC848C
7179x
BC848C
AM-WAVEBAND SWITCHING LOGIC
7172
MM74HCU04M
LW=Low
A
B
C
1
4

CS 51 864

Supl


MUTE CIRCUIT
not used in all versions
MUTE LEFT
MUTE RIGHT
MUTE
DISCRIMINATOR
PILOT PRES DET
PHASE DET
SWITCH
AM/FM SWITCH
V/S CONV
MATRIX
SYNCH DET
SOFT MUTE
AM/FM/IF COUNT AMP
SDS
CONTROL
MONO/ST SWITCH
VCO
LED DRIVER
DIVIDER
19/19/38kHz
LOOP FILTER
STEREO DECODER
BIRDY FILTER
FM/AM SWITCH
MUTE=High
MONO=Low
STEREO=Low
AM=HIGH
IF-COUNT=HIGH
MUTE=LOW
VERSION PROGR DIODES
0V=no communications
MUTE ON
OFF
Found strong signal during SEARCH
100ms
IF 200mVpp
SHIFT REGISTER LATCH
UNIVERSAL COUNTER
REFERENCE DIVIDER
PROGR. DIVIDER
COUNTER
PHASE DET.
LC7218M SYNTHESIZER
7.2MHz
Weak signal
Strongsignal
152kHz 150mVpp
stereo mono stereo
L=MUTE
L=valid signal
Tuning indic
TO/FROM CONTROL BOARD
AF.left
GND
AF.right
CL
DATA
COUNTER/DATA
CE
STEREO
MUTE
STSIG
11-16V
STABILIZING CIRCUIT +5V
L=weak sens. (Autostore 1. run)
SEARCH SENSITIVITY
TUNED=Low
Tuning-indic
FM OSC AMP
AM OSCILLATOR
PADDING
LOOP FILTER
Tuned down
Tuned up
AM-WAVEBAND SWITCHING LOGIC
MW/LW
LW=Low
LW=high
HEF 4069 UBT
MM 74HCU04M
HN1V02H
Vdc_FM_mode_stereo
Vdc_MW_mode
Vdc_LW_mode
voltages_measured_while set_is_tuned_to_a_strong transmitter
EVM

VERSION PROGRAMMING DIODES	6121	6122	6123
FM, MW, LW EUROPE			
FM, MW, LW EAST EUROPE	X	X	X
FM, MW USA /17	X		X
FM, MW OVERSEA /01		X	
FM, MW, LW, SW	X		
FM, MW, SW	X	X	
X=DIODE MOUNTED			

o for 2-band version only

x for LW version only

* for USA version only

1101	C 2
1153	C30
1173	D30
2100	C 2
2104	C 4
2107	I 8
2110o	N 4
2112	N 6
2114x	N 4
2115	J 7
2120	K 8
2121	K 8
2122	K20
2123	K20
2124	K22
2129x	O12
2130	N12
2133x	N15
2134	I22
2135	N14
2138o	N14
2139x	O15
2141	C10
2142	G13
2143	G13
2144	G14
2145x	O 5
2146x	N 4
2147	C 9
2150	H 7
2151	H 6
2152	H10
2154	C11
2155	C11
2156	B12
2157	C12
2158	C13
2159	C14
2160	B15
2161	C15
2162	I10
2168	I10
2169	I10
2170	O17
2171	N17
2172	M17
2173	M17
2174	I10
2175	K10
2177x	O18
2178	I21
2179	I21
2180	H25
2181	G25
2183	I23
2184	I29
2185	L 8
2186	F26
2193	J16
3106	L 7
3107x	P 5
3108	K 7
3109x	O 5
3110x	I12
3111	J10
3112	J11
3116x	L 4
3119	K21
3120	L 8
3121	K20
3122	K21
3123	N20
3124x	O 8
3125x	O15
3128	M15
3129x	O13
3132	M12
3141	D18
3142	G14
3144	H18
3147	I 9
3148	J 9
3149	J 9
3151	C 4
3154	B12
3155	C12
3156	D19
3157	I 7
3158x	O 2
3159	G13
3160	C13
3161	C14
3162	B15
3163	C15
3164	B16
3165	C16
3166	F27
3167	J29
3170	N18
3171	F29
3172	N17
3173	M16
3174	M16
3175	N17
3176	K10
3177x	O18
3178	J17
3179	I17
3180	C18
3181	C18
3183	E22
3184	E22
3185	J17
3186	J16
3188	H25
3189	E29
3190	E29
3191	E29
3192	E29
3193	M18
3194	G31
3195	H31
3197	H31
3200	K17
3201	I23
3220	J14
3222o	P 3
3223x	N 4
3224	M14
3226o	N14
3229o	O14
3233	M 5
3238x	N 9
3241o	O11
3242	M11
3243o	N10
3244	M 9
3245o	N 4
3248	C 5
3249x	I11
5105x	P 2
5106o	O 3
5109	I 7
5120	J 8
5122x	O10
5123	N10
5140	A 5
5142	A 8
5143	D 7
5144	D 9
5145	C10
5150	I10
5170	G25
6105	O25
6109	J 7
6121	E21
6122	E21
6123	E21
6124	K 8
6140	I 9
6154	D18
6174	I29
7102x	P 4
7104x	N 5
7105	I 7
7120	L20
7121x	O 8
7123x	O13
7128x	N15
7140	E 5
7150	J14
7150	J11
7150	A13
7150	C14
7150	B14
7150	B13
7152x	I12
7156	B16
7157	C16
7169	K18
7170	O17
7171	O17
7172	H16
7172	D20
7172	O20
7172	N22
7172	N20
7172	O22
7173	H24
7174	D17
7178	K16
7179x	O18
9197	C 3
9199	J 6
T001	C 2
T002	D 2
T005	O 4
T007	D 6
T008	D 6
T009	G 6
T010	H10
T011	H10
T012	C 8
T013	C11
T014	B11
T015	M16
T016	I29
T020	B29
T021	C29
T022	C29
T023	C29
T027	D30
T028	E30
T029	E30
T030	E30
T031	E30
T032	F30
T033	F30
T036	O17
T038	F22
T040	J16

Orginal

4730
4727

Midi System AS440/xxG AS445/xxG AS540/xxG

A95-350

Service
Service
Service

Product Service Group CE Audio

Service Information

Already published Service Informations: A94-360 (AS440)
A94-361 (AS540)

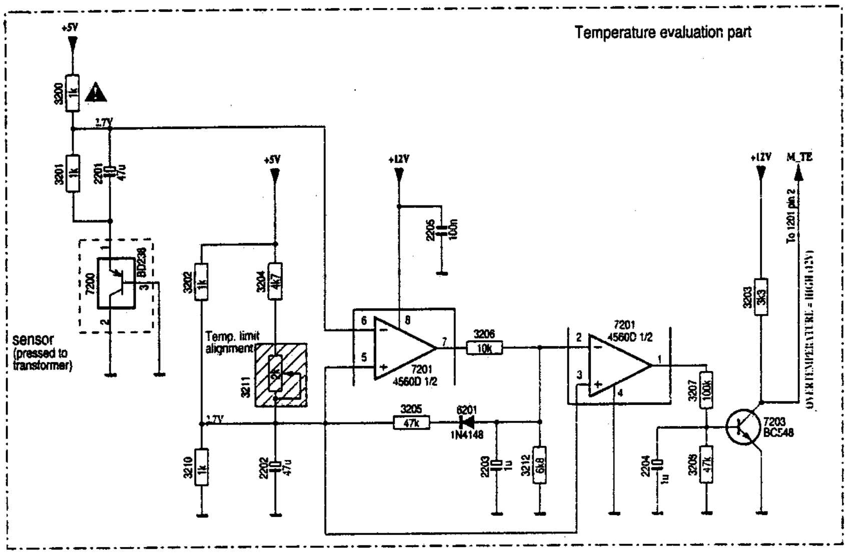
Correction to Service Manuals 4822 725 24929 (AS440) and 4822 725 24936 (AS540)

The codenumber for mains transformer AS440/22G should read 4822 146 31361.

TRAFO BOARD:
The temperature evaluation part for the transformer is drawn wrong resp. incomplete.

Correct is: 7200 (BD238) is not an NPN transistor as drawn in the Service Manual but a PNP type as drawn below. Therefore the BE-Diode is in forward direction. The voltage drop on the BE-Diode depends on the temperature of the transistor (= temperature of the transformer). A rise of the transformer temperature causes a lower voltage drop on the BE-Diode. Consequently the voltage on pin 6 of 7201 becomes lower too.

At about 85° Celsius the voltage on pin 6 becomes lower than the voltage on pin 5. The differential amplifier switches pin 7 to high level and in turn pin 1 to low. If pin 1 is at low level, transistor 7203 is blocked. The control line M_TE becomes high via pull up resistor 3203.


Temperature evaluation part
+5V
3200 1k
1.7V
3201 1k
2201 47u
7200
BD238
1
2
3
sensor (pressed to transformer)
+5V
3202 1k
3204 4k7
Temp. limit alignment
3211 2k
1.7V
3210 1k
2202 47u
+12V
2205 100n
6
5
8
7
7201 4560D 1/2
3206 10k
3205 47k
6201 1N4148
2203 1u
3212 6k8
7201 4560D 1/2
2
3
1
4
+12V
M_TE
To 1201 pin 2
OVERTEMPERATURE = HIGH (12V)
3203 3k3
3207 100k
7203 BC548
2204 1u
3209 47k

1995-03-29

GB 4822 725 24955

CS 52 016

Alignment of temperature limit :

Align with potmeter 3211 the voltage between pin 6 and pin 5 of 7201. Pin 6 must be more positive than pin 5. The value have to be calculated according to following formula:

$$\boxed{V = (85^\circ C - t_{amb}) * 1{,}15 \frac{mV}{^\circ C}}$$

e.g. for $t_{amb} = 20^\circ C$

$$V = (85^\circ C - 20^\circ C) * 1{,}15 \frac{mV}{^\circ C} = \frac{65 \cancel{^\circ C} * 1{,}15\ mV}{\cancel{^\circ C}} = 74{,}75\ \ mV$$

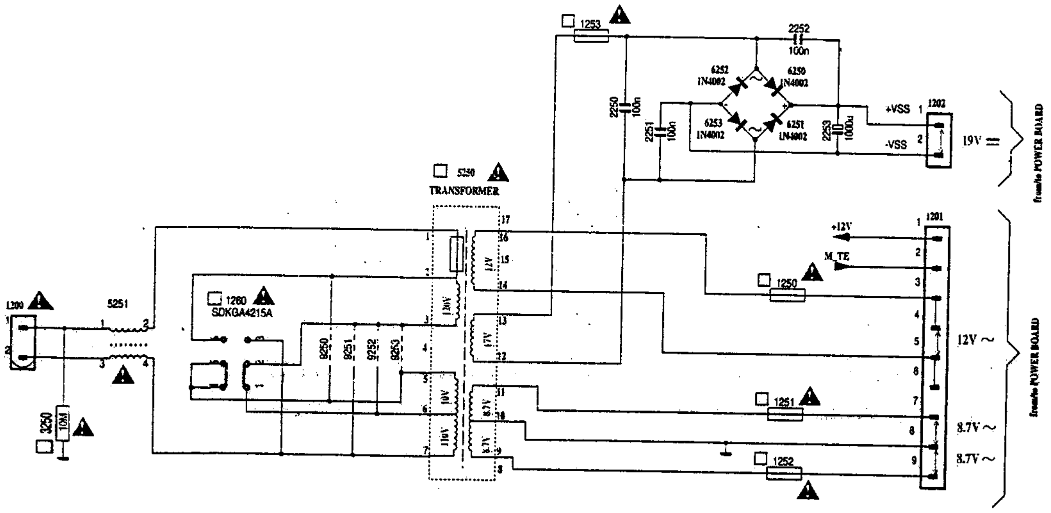
Attention:

Alignment of temperature have to be done with cold mains transformer. Remove mains plug for at least half an hour.

Values for the most common ambient temperatures:

t_{amb}	*voltage*	t_{amb}	*voltage*	t_{amb}	*voltage*
18°C	77mV	23°C	71,3mV	28°C	65,6mV
19°C	75,9mV	24°C	70,2mV	29°C	64,4mV
20°C	74,8mV	25°C	69mV	30°C	63,3mV
21°C	73,6mV	26°C	67,9mV		
22°C	72,5mV	27°C	66,7mV		

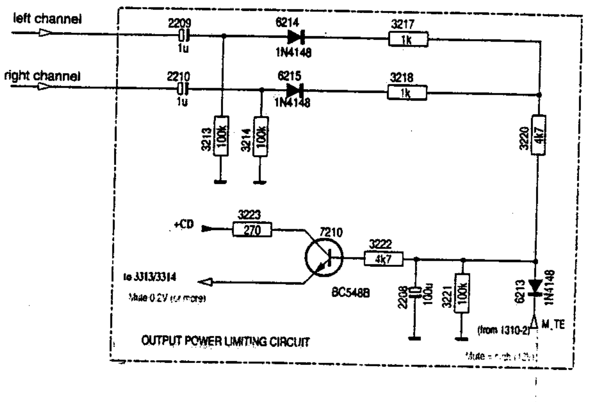
The OT-Mute line on pin 2 of connector 1201 should not read OT-Mute as drawn in the Manual but M_TE of course.


1253
2252
100n
6252
1N4002
6250
1N4002
6253
1N4002
6251
1N4002
2250
100n
2251
100n
2253
1000u
+VSS
-VSS
1202
19V =
from/to POWER BOARD
5250
TRANSFORMER
1201
+12V
M_TE
1250
1251
1252
12V ~
8.7V ~
8.7V ~
from/to POWER BOARD
1200
5251
1260
SDKGA4215A
9250
9251
9252
9253
3250
10M

You will find this line again on the bottom right hand corner of the Power Board (1310/pin 2).

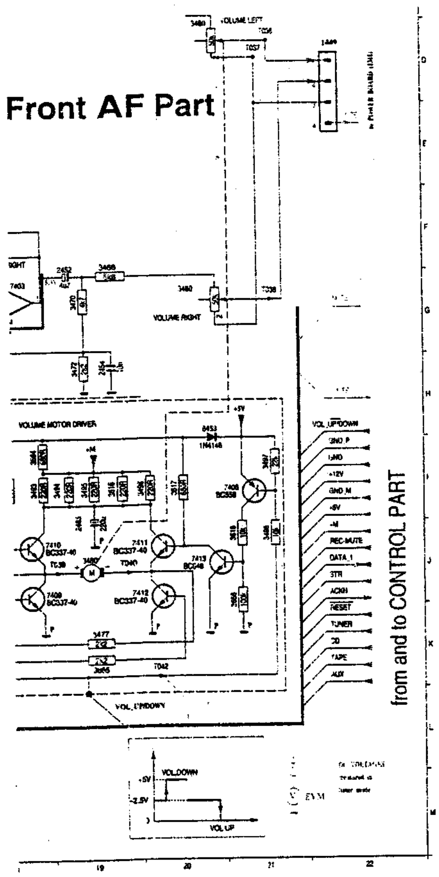
The M_TE signal is used:

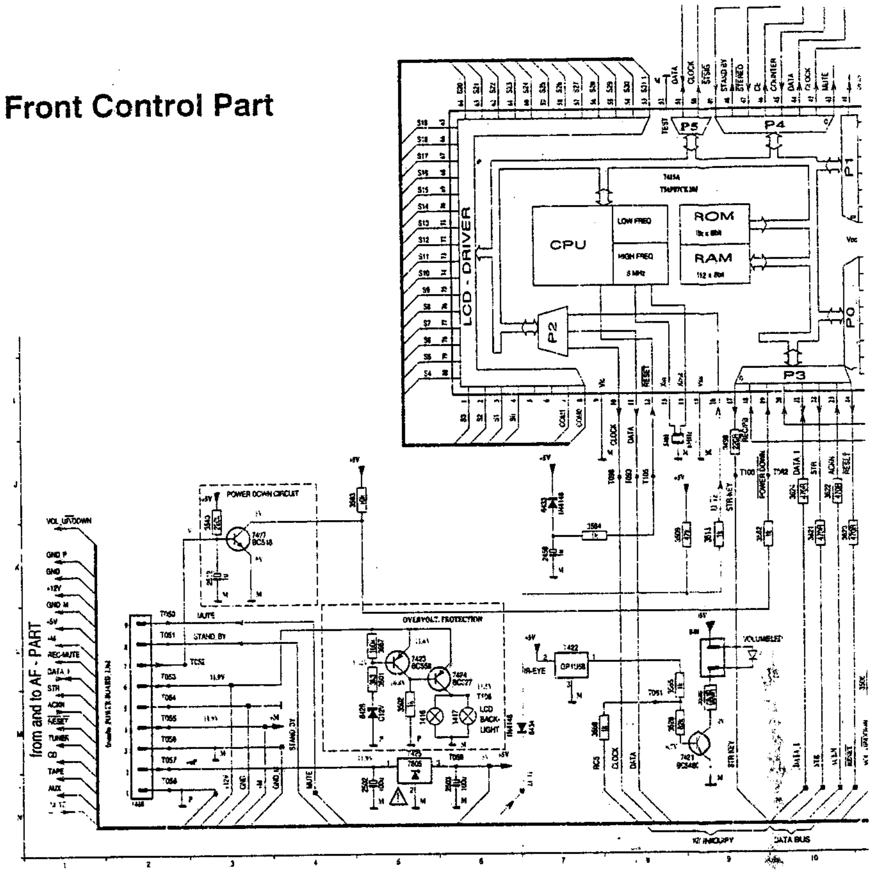
1) To control the Output Power Limiting Circuit (upper right hand corner of Power Board).
   If the transformer is overheated, the control line M_TE is high. In this case M_TE activates this circuit. Via 6214, 6215 the output signal of the power stage is rectified. The level of the DC voltage depends on the AC value of both channels. This DC voltage controls the current through 7210 and in turn the base current of the mute transistors 7311 and 7312.
   If the transformer is not overheated, transistor 7203 (on Transformer Board) is conducting. The control line M_TE has ground level. Because of the DC voltage (generated by the output signal) is positiv the diode 6213 is in forward direction. The DC voltage is shortcircuit. Transistor 7210 is blocked and consequently also the mute transistors 7311 and 7312.


left channel
right channel
2209
1u
2210
1u
6214
1N4148
6215
1N4148
3217
1k
3218
1k
3213
100k
3214
100k
3220
4k7
+CD
3223
270
7210
BC548B
3222
4k7
to 3313/3314
Mute 0 2V (or more)
2208
100u
3221
100k
6213
1N4148
M_TE
(from 1310-2)
OUTPUT POWER LIMITING CIRCUIT
Mute = high (12V)
closed if transformer temperature is less than 75 C
7203
on Transformer Board

Front Board:

2) To control the display.
(via connectors 1311/pin4 (Power Board) - 1449/pin4 (Front AF Part) → µP on Control Part. If the control line M_TE is high the text "hot" is blinking on the display.


Front AF Part
VOLUME LEFT
VOLUME RIGHT
VOLUME MOTOR DRIVER
1N4148
BC558
BC337-40
BC548
VOL_UP/DOWN
GND P
GND
+12V
GND M
+5V
+M
REC-MUTE
DATA_1
STR
ACKN
RESET
TUNER
CD
TAPE
AUX
from and to CONTROL PART
VOL.DOWN
VOL.UP
+5V
2.5V


Front Control Part
LCD - DRIVER
CPU
LOW FREQ
HIGH FREQ
ROM
RAM
P5
P4
P1
P0
P2
P3
TEST
DATA
CLOCK
STBIC
STAND BY
STEREO
MUTE
POWER DOWN CIRCUIT
BC548
OVERVOLT. PROTECTION
BC558
BC327
LCD BACK-LIGHT
1N4148
7805
IR-EYE
VOLUMELED
from and to AF - PART
VOL_UP/DOWN
GND P
GND
+12V
GND M
+5V
+M
REC-MUTE
DATA 1
STR
ACKN
RESET
TUNER
CD
TAPE
AUX
STAND BY
DATA BUS

Tape transport RDN11

For details and exploded view see Service Manual of tape transport RN/RR, RDN/RDR (general documentation)

Service Manual

(GB) MAINTENANCE

It is recommended to clean the recorder after approx. 500 hours of operation.

To be cleaned with alcohol or spirit

- Erase head
- Recording/playback head
- Capstan
- Pressure roller

(F) ENTRETIEN

L'appareil devra être nettoyé après env. 500 heures de marche aux points les plus importants.

Nettoyer les éléments suivants à l'alcool ou à l'alcool à brûler:

- Tête effacement
- Tête enregistrement/reproduction
- Cabestan
- Galet presseur

(NL) ONDERHOUD

Aanbevolen wordt het apparaat na ca. 500 bedrijfsuren schoon te maken

Schoonmaken met alcohol of spiritus:

- Wiskop
- Opneem-/weergeefkop
- Toonas
- Drukrol

(D) WARTUNG

Es empfiehlt sich, das Gerät nach ca. 500 Betriebsstunden zu reinigen

Reinigen mit Alkohol oder Spiritus:

- Löschkopf
- Aufnahme/Wiedergabe-Kopf
- Tonachse
- Andruckrolle

(I) MANUTENZIONE

E consigliabile pulire l'apparecchio dopo circa 500 ore di funzionamento ai punti principali.

Pulire con alcool

- Testina di cancellazione
- Testina di registrazione/riproduzione
- Capstan
- Rullo preminastro

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agrées, seuls habilités à réparer votre appareil en panne".

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SPECIAL FEATURES

(GB) CONTINUOUS PLAY

Definition: "Play" starts on deck A (play back deck). After tape end on deck A, deck B (REC/PB – deck) will be going on with **"Play"** till tape end. Then both decks will be in **"Stop"**- mode due to full auto shut off.
Operating sequence:
1) start with **"Play"** on deck A
2) switch **"Pause"** on deck B
3) switch **"Play"** on deck B
After tape end on deck A auto stop – mechanism is working.The locked "play"- button on deck A and the "pause"- button on deck B will be released. "Play"-mode on deck B will now be active. After tape end on deck B full auto shut off will be activated.

SYNCHRO START

"COPY" from deck A to deck B
Operating sequence:
1) switch **"Pause"** on deck B
2) switch **"REC"**(one touch) on deck B
3) switch **"Play"** on deck A
In that moment when the "play"- button on deck A will be depressed the "pause"- button on deck B will be released. Now "REC"- mode on deck B will be active. Both decks will be working.
If one of the cassettes reaches tape end full auto shut off will be activated and COPY is finished.

(NL) ONONDERBROKEN WEERGEVEN

Omschrijving: Het weergeven begint op deck A (weergavedeck). Nadat op deck A het einde van de band is bereikt, gaat het weergeven door op deck B (opname/weergave-deck). Op dat moment worden beide decks geheel automatisch in de stand "Stop" geschakeld.
Bedieningsvolgorde:
1) druk op toets **"Play"** op deck A
2) druk op toets **"Pause"** op deck B
3) druk op toets **"Play"** op deck B
Nadat het einde van de band op deck A is bereikt, treedt het autostop-mechanisme in werking. De vergrendelde toets "Play" op deck A en de toets "Pause" op deck B worden dan vrijgegeven. De stand "Play" op deck B is nu geactiveerd. Nadat het einde van de band op deck B is bereikt, wordt de volledig automatische uitschakeling geactiveerd.

SYNCHROON STARTEN

"KOPIEREN" van deck A naar deck B
Bedieningsvolgorde:
1) druk op toets **"Pause"** op deck B
2) druk (een keer) op toets **"REC"** op deck B
3) druk op toets **"Play"** op deck A
Op het moment dat de toets "Play" op deck A wordt ingedrukt, wordt de toets "Pause" op deck B vrijgegeven. De stand "REC" op deck B is nu geactiveerd. Beide decks zijn in werking.
Indien op een van de cassettes het einde van de band wordt bereikt, wordt de volledig automatische uitschakeling geactiveerd en het kopiëren beëindigd.

(F) LECTURE EN CONTINU

Définition: La lecture (**"play"**) démarre sur la platine A (platine de lecture). A l'arrivée en fin de bande sur la platine A, la platine B (platine d'enregistrement/lecture) poursuivra la lecture (**"play"**) jusqu'à la fin de la bande. Ensuite, les deux platines seront en mode arrêt (**"stop"**) grâce à l'arrêt total automatique.
Ordre de fonctionnement :
1) mettez en marche avec **"Play"** sur la platine A
2) appuyez sur **"Pause"** sur la platine B
3) appuyez sur **"Play"** sur la platine B
Après l'arrivée en fin de bande sur la platine A, le mécanisme d'arrêt automatique entre en fonctionnement. Les touches verrouillées "play" sur la platine A et "pause" sur la platine B sont alors débloquées. Le mode lecture ("play") sur la platine B est à présent actif. Après l'arrivée en fin de bande sur la platine B, l'arrêt total automatique sera activé. Lorsque la touche de "sélection de mode" est en position 2 (inversée), il est alors possible d'écouter trois faces de deux cassettes en continu.

DEPART SYNCHRONISE

Pour la COPIE de la platine A vers la platine B
Ordre de fonctionnement :
1) appuyez sur **"Pause"** sur la platine B
2) appuyez sur **"REC"** (enregistrement à une touche) sur la platine B
3) appuyez sur **"Play"** sur la platine A
Au moment où la touche "play" (lecture) sur la platine A sera enfoncée, la touche "pause" sur la platine B sera dégagée. Le mode "REC" (enregistrement) sur la platine B est à présent actif. Les deux platines fonctionnent.
Si l'une des cassettes arrive en fin de bande, l'arrêt total automatique sera activé et la COPIE terminée.

(D) CONTINUOUS PLAY

Definition: "Play" beginnt auf Laufwerk A (Wiedergabe – Laufwerk). Am Bandende von Laufwerk A setzt Laufwerk B (Aufn./Wg – Laufwerk) mit "Play" fort und läuft bis Bandende. Danach sind beide Laufwerke abgeschaltet.
Bedienungsablauf:
1) **"Play"**- Taste auf Laufwerk A drücken
2) **"Pause"**- Taste auf Laufwerk B drücken
3) **"Play"**- Taste auf Laufwerk B drücken
Am Bandende von Laufwerk A arbeitet der Auto stop – Mechanismus. Die "Play"- Taste von Laufwerk A und die "Pause"- Taste von Laufwerk B werden gelöst. Auf Laufwerk B ist nun die "Play"- Funktion eingeschaltet. Am Bandende von Laufwerk B schaltet die automatische Endabschaltung ab.

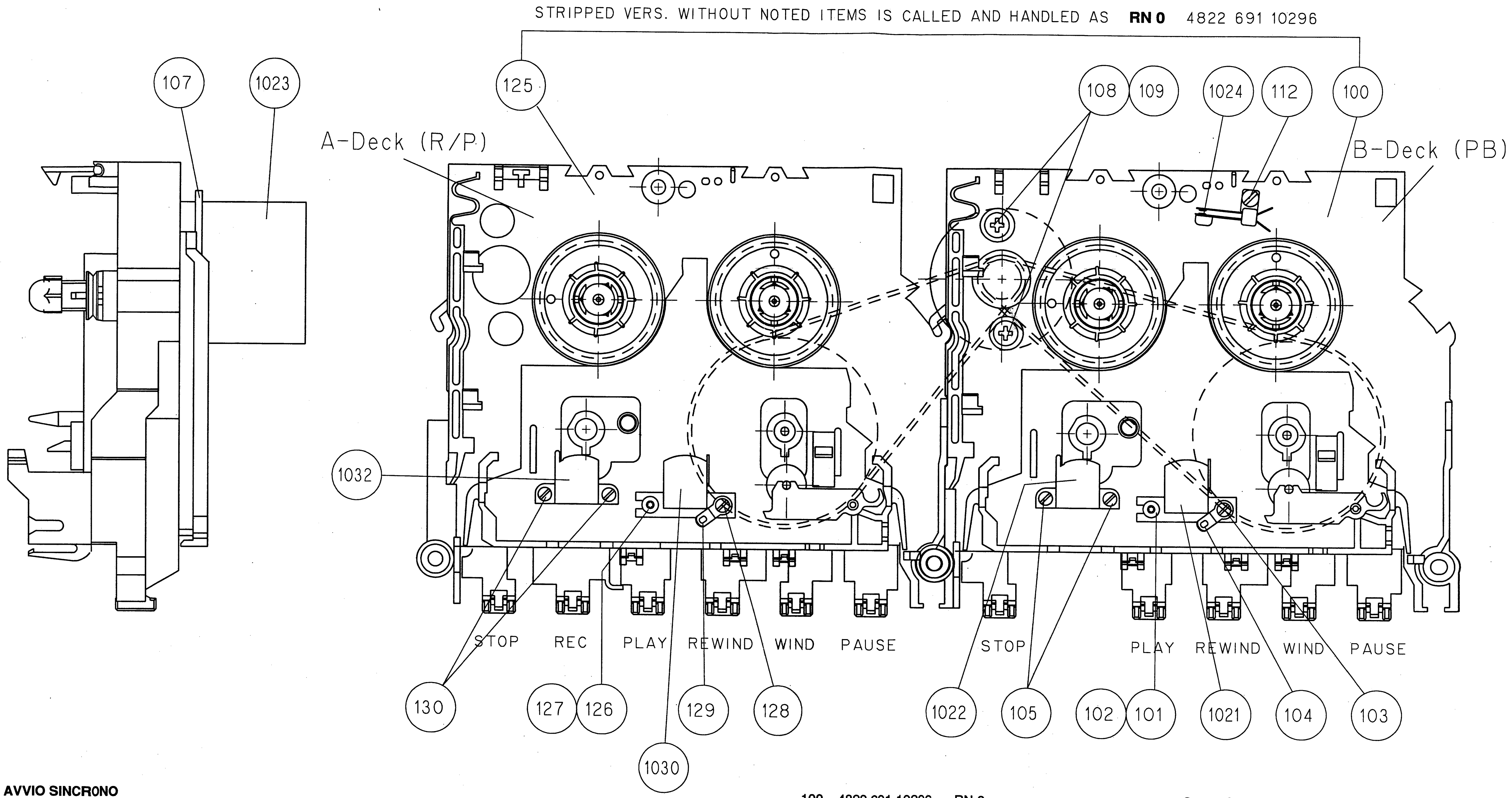
SYNCHRO START

"Kopieren" von Laufwerk A auf Laufwerk B.
Bediehungsablauf:
1) **"Pause"**- Taste von Laufwerk B drücken
2) **"REC"**- Taste (one touch) von Laufwerk B drücken
3) **"Play"**- Taste von Laufwerk A drücken
In dem Moment wo die "Play"- Taste von Laufwerk A gedrückt wird, wird die "Pause"- Taste von Laufwerk B gelöst. "Aufnahme"- Modus wird dadurch auf Laufwerk B aktiviert und beide Laufwerke arbeiten.
Erreicht eine der beiden Kassetten das Bandende, schaltet die automatische Endabschaltung ab und der Kopierbetrieb wird beendet.

(I) RIPRODUZIONE CONTINUA

Funzionamento: la riproduzione inizia con la cassetta nel riproduttore A. Alla fine del nastro della cassetta nel riproduttore A, la riproduzione viene continuata con la cassetta nel registratore/riproduttore B. In tale momento, ambedue gli apparecchi vengono commutati automaticamente nel modo di arresto.
Ordine di comando:

1) premere il tasto **"Play"** sul riproduttore A
2) premere il tasto **"Pause"** sul registratore/riproduttore B
3) premere il tasto **"Play"** sul registratore/riproduttore B
Alla fine del nastro della cassetta nel riproduttore A, viene attivato il meccanismo di arresto automatico dello stesso. Viene rilasciato il tasto "Play" sul riproduttore A ed il tasto "Pause" sul registratore/riproduttore B. Viene avviata la riproduzione della cassetta nel registratore/riproduttore B. Quando è stata raggiunta la fine del nastro della cassetta nel registratore/riproduttore B, ambedue gli apparecchi vengono arrestati automaticamente.


STRIPPED VERS. WITHOUT NOTED ITEMS IS CALLED AND HANDLED AS **RN 0** 4822 691 10296

AVVIO SINCRONO

COPIATURA della cassetta nel riproduttore A sulla cassetta nel registratore/riproduttore B.
Ordine di comando:
1) premere il tasto **"PAUSE"** sul registratore/riproduttore B.
2) premere (una volta) il tasto **"REC"** sul registratore/riproduttore B.
3) premere il tasto **"PLAY"** sul riproduttore A.
Premendo il tasto "PLAY" sul riproduttore A verrà rilasciato il tasto "PAUSE" sul registratore/riproduttore B e quest'ultimo predisposto per la registratione. La cassetta nel riproduttore A viene copiata sulla cassetta nel registratore/riproduttore B. Quando viene raggiunta la fine del nastro diuna delle cassette, ambedue gli apparecchi vengono arrestati automaticamente.

100	4822 691 10296	RN 0 assy
101	4822 492 51473	spring azimuth
107	4822 529 10254	damper,motor
108	4822 502 11866	screw,motor
125	4822 691 10296	RN 0 assy
126	4822 492 51473	spring,azimuth
1021	4822 249 10397	head,Rec/Pb
1022	4822 404 10685	head,dummy
1023	4822 361 21637	motor, MSI-5U2LWDR
1024	4822 271 30598	switch indication play
1030	4822 249 10397	head,Rec/Pb
1032	4822 249 20072	head,erase

Only those parts of which a service code number is stated are service parts.

General parts

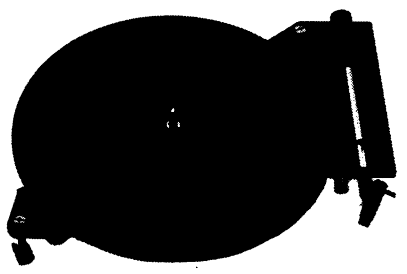
7/67	4822 520 10718	bearing plate
38	4822 520 40134	ball, bearing
40	4822 402 10037	lever, pinch roller right
41/76	4822 528 70646	pinch roller
43	4822 404 10853	slide, key lock
58	4822 358 30929	drive belt RN0 S (long)
98	4822 358 30928	drive belt RN0 D (short)
402	4822 528 20676	take-up clutch assy

(pos. number refer to exploded view in General Documentation 4822 725 23763)

Record player DL-40

3139 118 72550

Service Manual



Specification

Power supply:	12V dc at 80mA
Wow and flutter:	0.25% JIS 0.35% DIN
Operating speed:	33 1/3 - 45rpm
Drive system:	Belt drive with auto return

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

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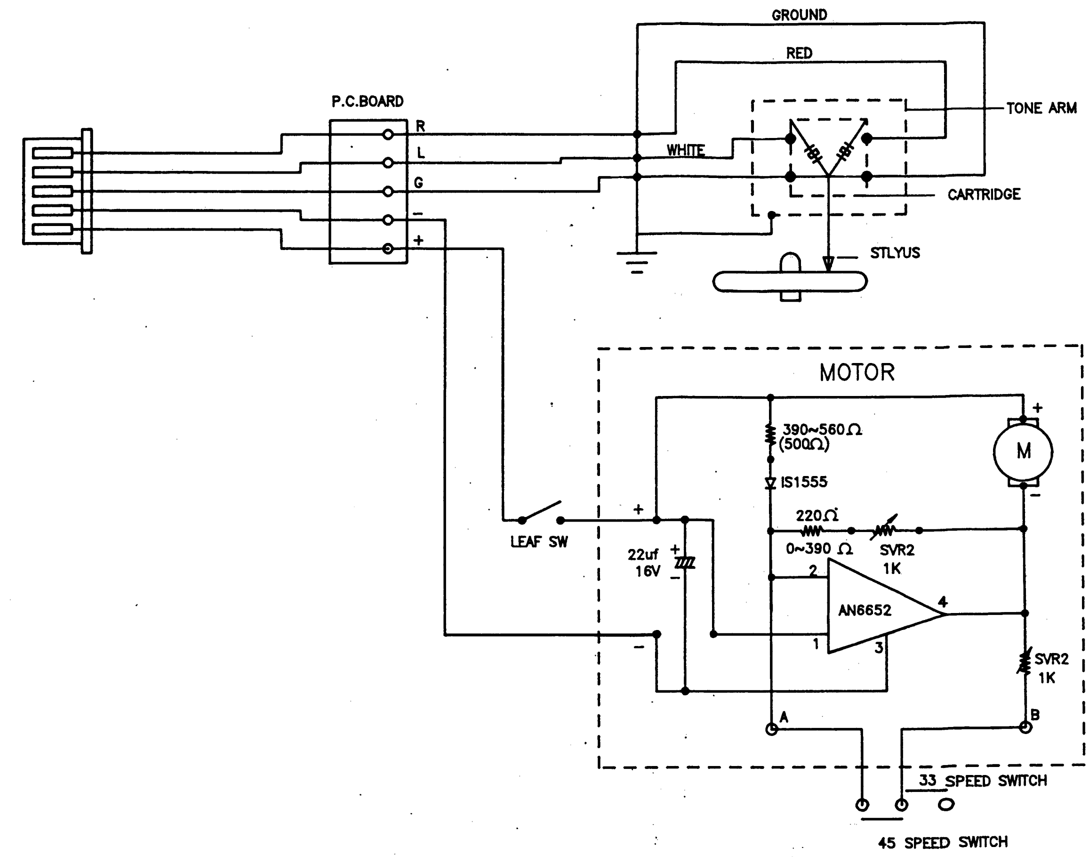
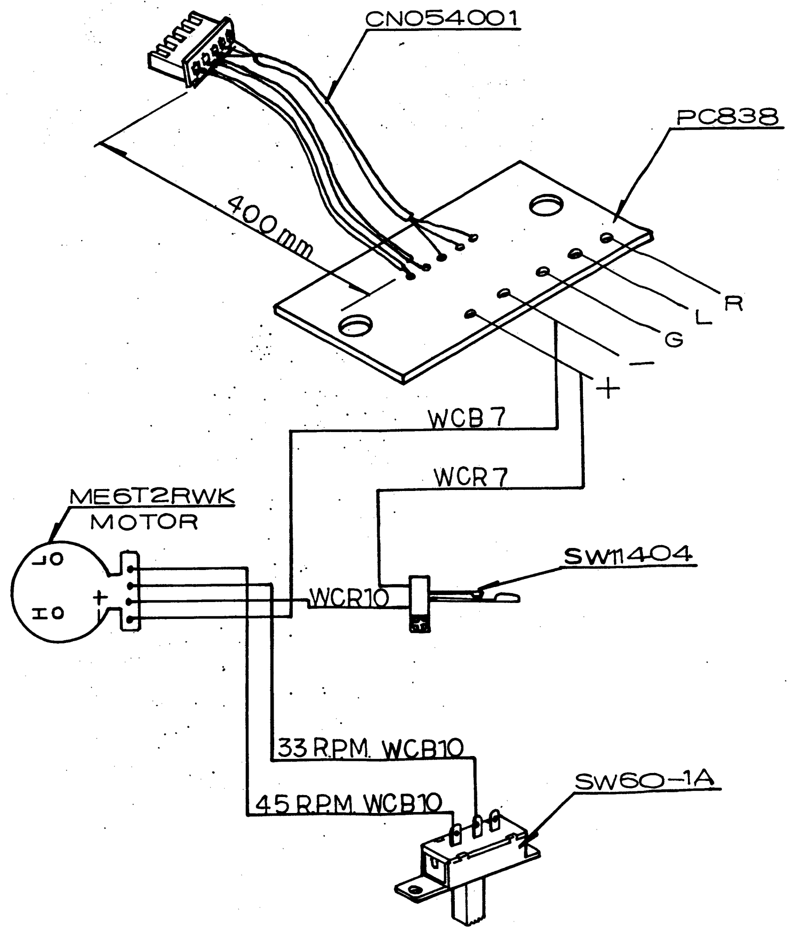
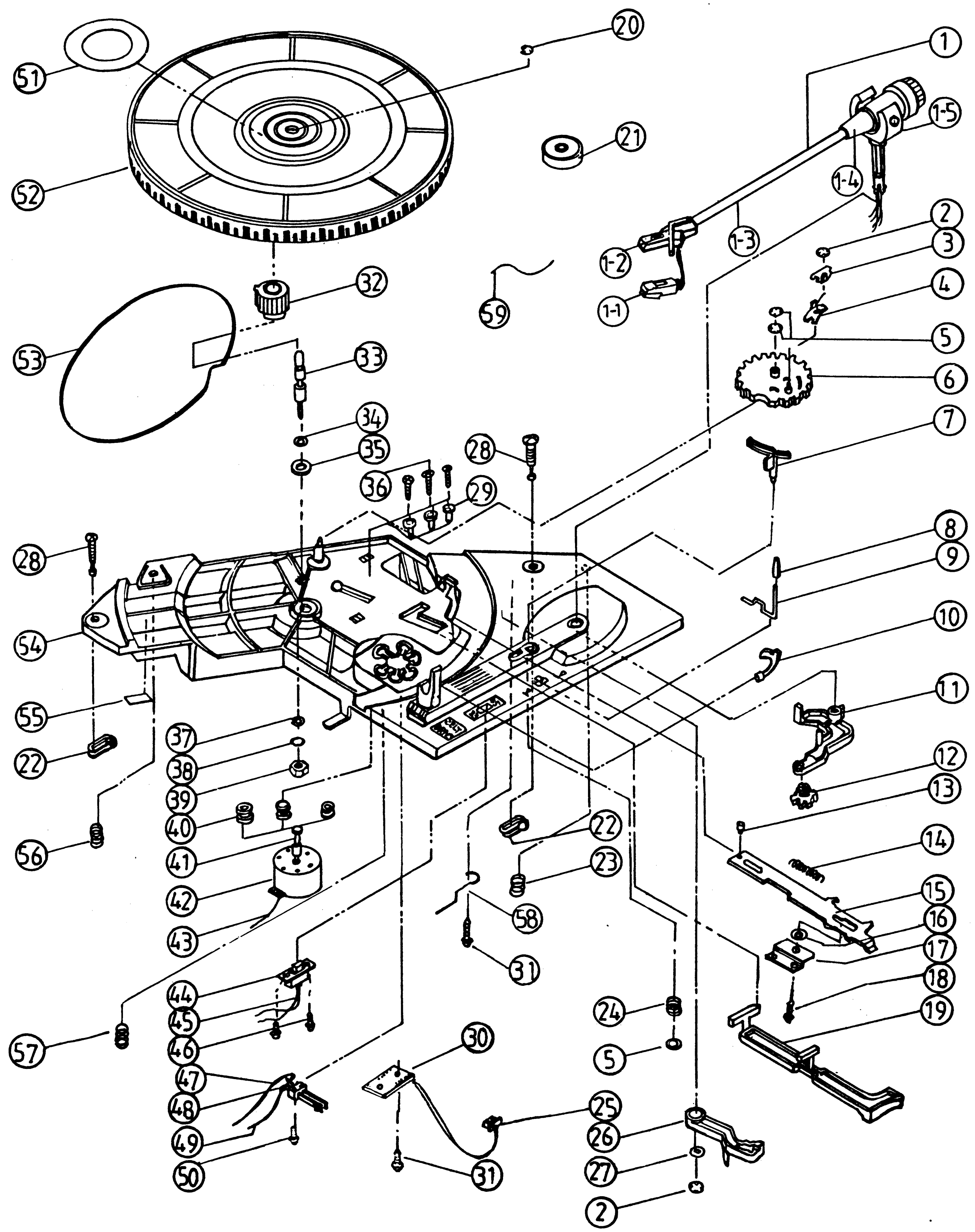
4822 725 23237


GROUND
RED
P.C.BOARD
R
L
G
–
+
WHITE
TONE ARM
CARTRIDGE
STLYUS
MOTOR
390~560Ω
(500Ω)
IS1555
220Ω
0~390 Ω
SVR2
1K
LEAF SW
22uf
16V
AN6652
1
2
3
4
M
A
B
33 SPEED SWITCH
45 SPEED SWITCH


CNO54001
PC838
400mm
R
L
G
–
+
WCB7
WCR7
ME6T2RWK
MOTOR
WCR10
SW11404
33 RPM. WCB10
45 RPM. WCB10
SW60-1A

EXPLODED VIEW


1
1-1
1-2
1-3
1-4
1-5
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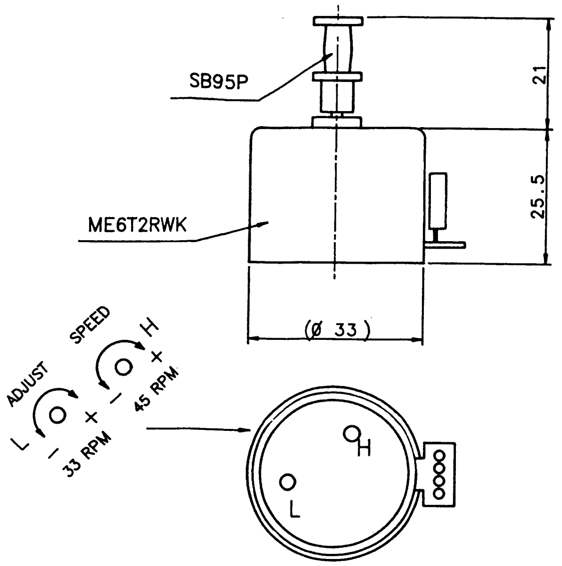
SB95P
ME6T2RWK
21
25.5
(Ø 33)
ADJUST
SPEED
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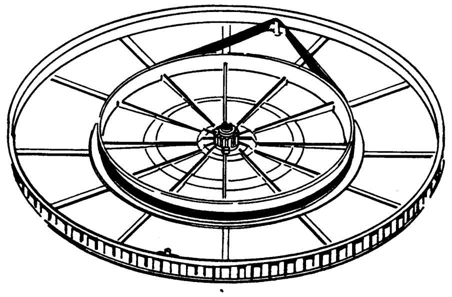
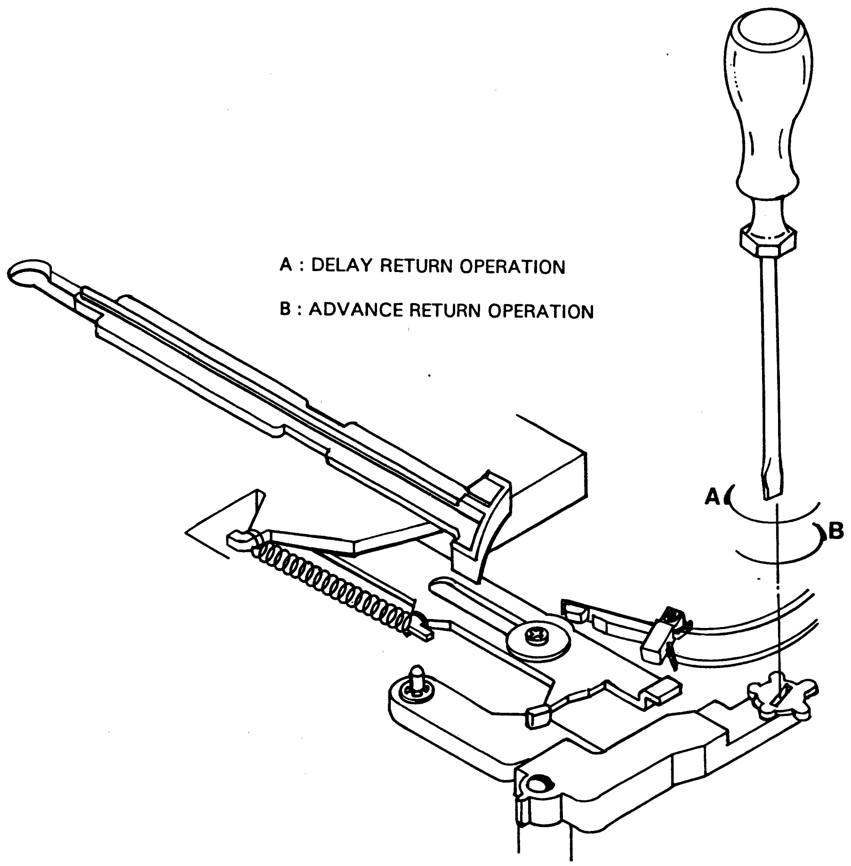
–
+
33 RPM
H
+
–
45 RPM
H
L

PLACEMENT OF BELT





A : DELAY RETURN OPERATION

B : ADVANCE RETURN OPERATION

01	4822 251 70328
1-1	4822 251 30153
02	4822 530 80538
05	4822 530 80539
06	4822 522 33247
07	4822 402 61417
08	4822 462 41916
09	4822 402 61413
10	4822 402 61416
11	4822 402 61414
12	4822 402 61415
14	4822 492 71081
22	4822 492 71082
23	4822 492 71079
24	4822 492 71077
26	4822 466 93093
27	4822 532 52438
28	4822 502 13959
29	4822 532 52302
32	4822 522 33225
34	4822 532 52439
35	4822 532 52434
37	4822 532 52449
40	4822 462 71829
41	4822 528 50332
42	4822 361 21305
44	4822 277 21596
48	4822 276 13251
51	4822 460 20803
52	4822 528 10843
53	4822 358 31178
56	4822 492 71078
58	4822 492 71095

Note : Only the mentioned parts are normal service parts.